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THE STATEMENT published in our market columns this week shows a material falling off in coal exports this year, besides that in Canadian trade due to the stoppage of anthracite shipments. The European trade, in which a beginning was made two years ago, has almost disappeared. The only exception in the decrease is found in shipments to Italy, and a regular, though moderate trade in coal to that country seems to have been established. It was hardly to have been expected that the trade which owed its origin to a temporary increase in demand could continue after the exigency had passed; and it is hardly to be regretted.



AMERICAN export trade is in a unique position; orders are plentiful, prices good, and ocean freight rates easy, yet the heavy domestic consumption has taken many exporters out of the market. A feature of interest is the growing demand for mining, electrical and other machinery abroad, owing to the industrial revival in Europe and the resumption of mining in South Africa. The total value of the machinery exports in the seven months ending July 31 was \$27,096,338, which compares with \$23,651,655 in the corresponding period of last year; showing an increase of 14.6 per cent in 1902. The machinery exports this year were equal to 47.8 per cent of the total reported for all iron and steel products, whereas last year the proportion was 38.6 per cent. Judging from the inquiries received, and the business already booked by manufacturers, the export trade in machinery this year, will be the largest on record.

GERMAN iron production shows some recovery from the depression of last year, the output of pig iron for the six months ending June 30 having exceeded that for the first half of 1900 by 59,997 tons, or 1.5 per cent. The output for the half-year, as returned by the German Iron and Steel Association, was as follows, in metric tons:

	1901.		1902.	
	Tons.	Per ct.	Tons.	Per ct.
Foundry iron.....	759,498	19.2	790,172	19.7
Forge iron.....	728,776	18.4	596,485	14.9
Bessemer pig.....	238,931	6.1	190,992	4.7
Thomas (basic) pig.....	2,226,574	56.3	2,436,127	60.7
Totals.....	3,953,779	100.0	4,013,776	100.0

The changes in actual quantities and in the proportion of the different classes of iron to the total, are shown below:

	Tons.		Per ct.	
Foundry iron.....	I.	30,674	I.	0.5
Forge iron.....	D.	132,291	D.	3.5
Bessemer pig.....	D.	47,939	D.	1.4
Thomas (basic) pig.....	I.	209,553	I.	4.4
Total.....	I.	59,997		

It will be seen that the gain was chiefly in basic pig, though foundry iron also showed a small increase. There was a large decrease in forge iron, and bessemer pig also showed a decline which was proportionately large. A part of the increase in output was due to sales of pig iron and steel billets for the United States.



AMERICAN mining and metallurgical dividends in August were the third largest paid for any month this year. This good showing is due to the heavy quarterly payments by the big industrial combinations, and also to the initial declarations this year of six mining properties in various States. During August 48 companies distributed \$13,134,217, of which the metal mines contributed \$2,410,753 and the industrial concerns \$10,723,464. The most prominent individual payer was the United States Steel Corpo-

ration, which reported \$9,130,497, being a quarterly dividend of 1 3/4 per cent on its outstanding preferred stock.

There were also paid in August \$140,788 by 13 Mexican companies, \$15,000 by one in Central America, controlled in New York, and \$12,500 by a British Columbia gold mine.

Companies interested in the mineral industry of the United States have paid a total of \$103,660,451 in dividends since January 1, this year. In Mexico, Central and South America, and Canada the dividend payments this year have also been large, those reported aggregating \$2,384,670, a good part of which has gone to stockholders in the United States and other countries.



MARKET CONDITIONS.

Iron and Steel.—A temporary quiet seems to have settled upon the iron and steel markets, though it is probably not destined to continue long. Apparently orders for immediate delivery have been satisfied to some extent by the home producers and by imports, since the pressure for such deliveries is much less than has been reported in recent weeks. At the same time, there has been some postponement of work, the materials for which could not be obtained in season. The parties who were executing such work seem to have accepted the situation, or at least, have been compelled to do so by the high premiums exacted. There is no cessation of activity at the furnaces and mills; the only change to be reported is that deliveries of coke have been somewhat better, relieving the embarrassment of several of the blast furnaces, which had been compelled to curtail their production. Import business continues large by comparison, although the actual receipts of foreign material are still very small when we compare them with the totals of our own productions.

Copper.—The condition of the copper market shows some improvement. While there has been no material change in prices, manufacturers are evidently taking much more interest in the market and inquiries for metal are more numerous. It is to be noted that orders received are generally for immediate delivery, showing that the stocks on hand of the consumers are very low. A full discussion of the present stocks of copper, and of the consumption for the first half of the current year, will be found in another column.

Other Metals.—The metal market generally continues active. While tin has been somewhat dull, consumption is good and deliveries continue to be made on a large scale.

Lead remains unchanged in price, but consumption is large and the demand is steady.

Spelter is again strong and active with prices fully up to the range of several weeks past. The consumption of this metal is evidently on a larger scale than has ever been known before in this country, and the smelters have difficulty in making deliveries as promptly as they are asked for.

Coal.—The Western coal markets are still struggling with transportation difficulties. The supplies accumulated in the larger cities, are said to be exhausted and dealers find that it is not easy to secure deliveries from the mines with any degree of promptness. The Lake trade is suffering especially and shippers are beginning to be very doubtful of their ability to secure the coal which they require, before the close of Lake navigation. This looks very much as if there would be a shortage in the north-

western ports; and the difficulty is to see how this can be made up under present conditions.

The Seaboard bituminous coal trade continues active, with prices generally affected by the increased demand due to the shortage of anthracite. The season is approaching when New England dealers expect to have their winter stocks made up and many of them are beginning to complain of the delay in the delivery of their supplies.

In the anthracite market, conditions show but little change. The reported adoption of measures to reopen the mines excited some interest, but the actual steps taken towards such a result have resulted in little or nothing so far.



THE SITUATION IN THE ANTHRACITE COAL TRADE.

CONDITIONS in the anthracite strike have not shown any material change during the past week, although there are some indications that the strikers are weakening, as the failure of the funds contributed for their benefit to affect any material improvement in their condition, becomes more manifest. The companies however, do not seem to be in any hurry to take advantage of this or to reopen the collieries to any considerable extent. The Lehigh Coal and Navigation Company is operating one of its mines in the Panther Creek Valley and there has been a little trouble there, which appears to have been stopped by the prompt action of the militia. The Lackawanna and the Delaware & Hudson companies are doing some work, chiefly at the washeries near Scranton, and it was expected that the Delaware & Hudson would reopen one of its collieries about the close of the present week. No general measure of resumption is planned according to the present indications, and there seems to be a possibility that the strike will drag on for several weeks longer.

On September 3 it was announced from Washington that the report on the strike made by Col. Carroll D. Wright, Commissioner of Labor, some time ago, had been submitted to the Attorney-General, who after considering the report, had decided that the President had no power whatever to act in the matter. This decision might have generally been expected.

Col. Wright's report is not long and sums up carefully the conflicting evidence submitted by operators and miners. In his resumé of the grievances, charged on both sides, there is really nothing which has not been published already, except that his statement is a very fair and compact one, without bias, in favor of either party. In conclusion, he suggests a reorganization of the existing Union as an anthracite miners' union, which should be independent of the bituminous miners' union, although it might be federated with that body. The conditions in the anthracite country being entirely different from those of the bituminous mines, make this separation in his opinion, a desirable step. He also suggests that it would be reasonable for the operators to concede a nine-hour day for the period of six months as an experiment in order to test the influence of production. He recommends that a joint conciliation committee be appointed, to be composed of representatives of the operators and the miners to which all grievances should be referred for investigation. This committee or board of conciliation should have full authority to act, its decisions to be binding on both parties. Col. Wright's plan has evidently been carefully thought out and should be given a careful consideration by both parties, though it is to be doubted whether it will be accepted by either at the present time. When the strike is over and feeling has somewhat subsided there may be an opportunity to bring it into use.

COPPER AND COPPER STOCKS.

IN THE ENGINEERING AND MINING JOURNAL for June 14 last we published an estimate of copper production, consumption and stocks for the year 1901. As it was necessary at that time to estimate both the consumption and the stocks on hand, the statement was of necessity largely tentative in its nature. It served the purpose of bringing us criticisms from experts, the value of which we take much pleasure in acknowledging; and these were of great service in enabling us to make up a more complete and nearly accurate statement, which will appear in the volume of *The Mineral Industry*, shortly to be issued.

According to this corrected statement the stocks of copper in existence in this country on December 31, 1901, were less than has been supposed, and much less than was generally reported. The stocks which may be regarded as normal—that is the copper in transportation from mines and smelters, in process of refining, etc.—amount always to between two and three months' production, and we can only consider as surplus the quantity in excess of that. Under these conditions we are brought to the conclusion that the surplus at the opening of the current year—that is the quantity in excess of normal stocks—did not exceed 70,000,000 pounds. This surplus, while large enough to be a disturbing element in the market, was, as we have already said, very much less than was generally reported at the time. With the special motive of the rumors then current we have nothing to do here; but our readers know that we never gave them anything like full credit.

We are aware that our estimate of the stocks at the opening of the year is much below that made by the statistician of the Geological Survey. Our figures, as given in the table below, for the copper on hand January 1 are 209,588,000 pounds, while those given in the statement referred to are 300,000,000 pounds. While admitting a possibility of error, we are convinced that our statement is a close approximation to the truth. The higher estimate referred to has resulted, we believe, from too high an allowance for imports from Mexico and Canada—for which we have received exact figures—and from an under-estimate of the consumption for 1901; both errors into which a statistician not thoroughly familiar with the market is liable to fall.

We have now a new point of departure in the figures for the stocks existing on August 1, as given in the statement prepared by Dr. A. R. Ledoux, which is given on another page. The correctness of these figures is guaranteed by the standing of Dr. Ledoux, the care taken in its preparation and the fact that it is the work of an observer whose only interest has been to ascertain the actual facts. We are quite satisfied to accept this statement as showing the actual facts as they exist at the present time.

This statement gives the stocks of copper in the United States on August 1 as follows, in pounds:

Refined copper on hand.....	69,541,297
Bars, anodes, etc., in process of refining.....	62,610,909
Copper in matte, etc.....	7,099,280
Total on hand, August 1.....	139,251,486

As the reported production of copper in the United States is now between 59,000,000 and 60,000,000 pounds monthly, the stocks above shown amount only to about 70 days' output; that is they are below the normal stocks above referred to. It will be noted also that the refined copper—that is metal available for delivery to consumers—forms somewhat less than one-half of the total. A considerable part of this also may be considered as covered by contracts for future delivery and therefore practically out of the market, though it may still be in the hands of sellers.

Taking the stocks as above given, and the statement of production as made by Mr. John Stanton, with an

allowance for copper in by-product sulphate, we find the following results:

	Pounds.
Stocks on hand January 1.....	209,588,000
Production for seven months.....	381,520,280
Imports, less foreign copper re-exported.....	69,776,000
Total supplies.....	660,884,280
Exports for seven months.....	242,699,500
Approximate consumption.....	278,933,774
Total.....	521,632,274
Stocks, August 1, as above.....	139,251,486

This shows an approximate consumption of 39,847,600 pounds per month; a high figure, but still rather below the estimates of some experts.

The position is therefore that whatever surplus existed at the opening of the year has been worked off, and that the current consumption and the foreign demand are fully equal to the production. The latter, while some check has been caused by the temporary closing of the United Verde and by some reduction at other mines, is, on the other hand, being increased by some of the newer mines and from outside sources. It is quite probable that it will continue on about the present scale for the balance of 1902. It is, however, altogether unlikely that we shall see any accumulation of unsold copper during the present year.



SENATOR KEARNS'S NEW MINING LAW.

HON. THOMAS KEARNS, of Utah, introduced in the U. S. Senate on the 7th of March last a bill "to amend Section 2322 of the Revised Statutes of the United States, and for other purposes," which was referred to the Committee on Mines and Mining, and was reported from that committee by Mr. Kearns on the 11th of June, with an amendment in the form of a substitute more carefully drawn. This substitute, which will come up for action at the next session, is as follows:

BE IT ENACTED, ETC., That section twenty-three hundred and twenty-two of the Revised Statutes is hereby amended so as to read as follows:

"Sec. 2322. Locators of mining locations hereafter made on any mineral vein, lode, ledge, or mineral deposit situated on the public domain containing gold, silver, cinnabar, lead, tin, copper, or other valuable deposits, their heirs or assigns, where no adverse claim exists at the passage of this act, so long as they comply with the laws of the United States and the State and Territorial regulations not in conflict with the laws of the United States governing their possessory title, shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their location and of all veins, lodes, ledges, and mineral deposits throughout their entire depth which lie within such surface lines extended downward vertically. Such location shall be in rectangular form and shall not exceed one thousand five hundred feet in length on either the end or side lines thereof: Provided, That irregularly shaped claims may be located where previous locations render rectangular locations impracticable, but such claim shall not exceed in area a claim one thousand five hundred feet square. Every location hereafter made shall be distinctly marked on the ground so that the same can be readily traced. Within ninety days from the date of location the locator shall cause the same to be surveyed and a plat thereof recorded in the office of the county recorder of the county in which the claim is situated. No person shall locate more than one claim in the same mining district: Provided, That he shall have the privilege of filing with the recorder of mining records in the district a notice of abandonment of a claim located by him, and thereafter he shall have the right to locate another claim as fully as if no location had been made by him in said district. And the claim so abandoned shall be opened to relocation.

"Sec. 2. That section twenty-three hundred and twenty-three of the Revised Statutes relating to tunnels be, and the same is hereby, repealed.

"Sec. 3. That all acts and parts of acts in conflict with the provisions of this act are also repealed."

1. The provisions of this bill are simple and direct. But they might be amended in phraseology with advantage to their style. For instance, the grant of the "surface * * * and of all veins, lodes, ledges and mineral deposits throughout their entire depth which lie within such surface-lines extended downward vertically," is awkward in several particulars.

It seems to imply that whatever is not "surface," or mineral deposit below the surface, is not granted. This ambiguity exists in the present law, and has led to varying decisions in the Circuit Courts, some of which have held that the surface-right conveyed by the U. S. patent does not include the ownership of the country rock under ground—so that a tunnel run in barren rock beneath the surface of a patented claim would not be a trespass. (See, for instance, *Montana Co. vs. Clark*, 42 Fed., 626). It is true, that *Cheeseman vs. Shreve*, 37 Fed., 36, and many other cases have been decided in the opposite sense; and it is now settled, I suppose, that the patent conveys a fee simple to all below the surface, except mineral deposits apexing outside. But there is no reason for continuing the imperfect form of the grant.

Another awkward expression in the present law is here unnecessarily reproduced. Surface lines cannot be "extended downward vertically." It would be better to say "vertical planes drawn through the surface lines."

The sentence, "No person shall locate more than one claim in the same mining district; Provided, That he shall have the privilege," etc., has a queer sound. Who shall have this privilege? "No person?"

But all these infelicities of phrase do not affect the plain meaning of the text. It would look better if it were grammatically correct, but everybody will understand what is meant.

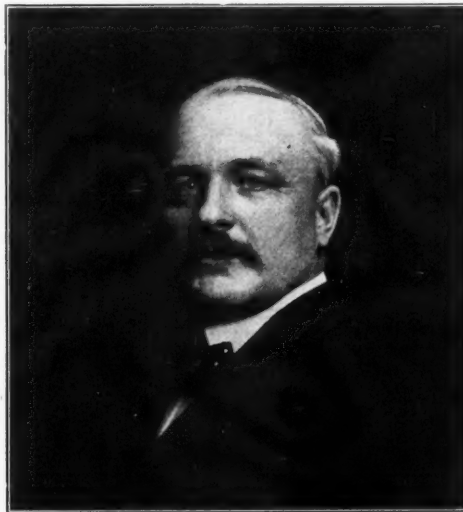
2. I question, however, whether the requirement of a survey within 90 days from the date of location is wise. It is new—and in a proposed act intended to effect a simple and radical reform, provisions embodying other desired reforms ought to be avoided, because they increase the difficulty of securing the main purpose, by arraying against the passage of the act all who object to any of its features. Now, many might object to this requirement of a survey. In new, wild districts, it might not be easy to fulfill it; and, after going to that trouble and cost, the locator would still have to pay for the regular survey required for the patenting of the claim. For this early survey could not possibly serve as the final one, which is official, and cannot be altered.

3. The provision forbidding the location of more than one claim in the same district by the same person is hardly worth inserting. So long as possessory titles are transferable, it will be a dead letter, as was the similar prohibition, in the Act of 1866, of the taking of more than one claim upon the same lode by the same person. It was perfectly easy to locate in different names and transfer the locations afterwards to one person, who became as grantee fully possessed of the rights of the several original locators. But this renewal of the attempt to limit the number of locations, while it would not prevent the acquisition of any number after location, might be a vexation to prospectors, many of whom make numerous locations, do the annual assessment work on all for a while, and finally select for active development those which promise best. If a prospector must stop with his first location, prospecting expeditions will be tame affairs. Now these adventurers are the scouts of the mining industry, and their useful work ought not to be discouraged.

4. But there is another weakness, in the proviso that a locator may file with the district recorder of mining records a notice of abandonment, after which, he may locate again in the district, and the claim so abandoned shall be open to relocation.

Why should the plat be filed with the county recorder and the notice of abandonment with the district recorder? What is the value of a record in one office, which is thus nullified by a record in another? Must the county recorder consult the district recorder, before he can accept the notice and plat of a location from a locator, already in his books?

This difficulty is partly, but not wholly removed by the circumstance that the office of district recorder is almost every where extinct. The Federal law requires no record of location whatever (see *Lindley on Mines*, Sec. 273, p. 249, where numerous cases are cited), but leaves this matter to State or Territorial law or local custom not inconsistent therewith; and all the States and Territories (including Senator Kearns's State, see the Utah Act of 1897), have made the county recorder the custodian of mining records. The mining district, with its officers, has



H. WALTER FITCH.

thus practically ceased to have any reason for being. It was never anything more than an informal, popular organization, the rules and customs of which were recognized in the courts, when not inconsistent with regulations of higher authority. But as the district was never (except by Wyoming, in 1888) explicitly authorized by law, so it has never been explicitly abolished or forbidden, though judges and lawyers, from time to time, have urged that some such measure should be adopted. What has been done in that direction consists simply in Federal and State legislation, prescribing many things which the miners in their district mass-meetings, once decided for themselves. But the old districts, still nominally exist; new ones are still organized, occasionally; and it is, so far as I know, quite within their power to elect recorders or other officers, and to make rules on subjects not covered by State or Federal legislation, or not inconsistent with such legislation. It is unwise, I think, to recognize in a Federal statute the indeterminate, irregular and moribund, yet still possibly mischievous mining district. No such statute can be equitable. For instance, some districts are very small; others are very large. Why should the boundaries of the "district" be the limits of a locator's rights? In some regions there are no longer any districts. What would be the effect of this law there? Would it forbid the location of more than one claim by the same person in the same county or State?

5. In short, the best way to abolish the "extralateral right" of the present statute is to change the grant which it makes to the locator, leaving the method of location and the proceedings for obtaining patent just

as they are. These administrative details can be amended at any time, and each proposed amendment can stand or fall on its own merits, without endangering the main reform. I would therefore simply leave out the last part of section 1 of this bill.

6. The repeal of the "tunnel section" of the present law, contained in Sec. 2 of this bill, is exactly right. There is no use in amending that thoroughly bad provision. Let us kill it first, even if we plant something else in its place hereafter. But, really, I am inclined to think that nothing else is needed in the Federal law. The legitimate regulation of tunnels, rights of way, etc., belongs to the States. All that the United States needs to do, or ought to do, is to sell its mineral lands outright, and give clear title to the purchasers.

R. W. RAYMOND.



H. WALTER FITCH.

We present herewith an excellent photograph of Mr. H. Walter Fitch, the newly elected president of the Lake Superior Mining Institute, and which was received too late for last week's issue of the JOURNAL containing an account of the meeting. Mr. Fitch is the agent for the Champion Mining Company at Marquette, Mich., and is one of the best known iron men in the Lake Superior country. He has taken active interest in the work of the Mining Institute from the time of its organization, and his election to the presidency gives general satisfaction to the members.

CANADIAN MINING INSTITUTE.

As announced, a meeting of the members of the Institute will be held at Nelson, B. C., on Wednesday and Thursday evenings, September 10 and 11.

A number of members in the East left Montreal for Nelson this week. While this meeting is held principally for British Columbia members and mining men, many of the eastern members availed themselves of this exceptionally interesting excursion.

The following is the list of papers promised for this meeting:

1. Notes on Smelting, by R. R. Hedley, Nelson, B. C.
2. On the Future of the Coal and Coke Supply of British Columbia, by Wm. Blakemore, Fernie, B. C.
3. Subject not announced, by Mr. Frederick Keffer, Anaconda, B. C.
4. Coarse Concentration in the Slocan District, B. C., by S. S. Fowler, Nelson, B. C.
5. Mine Timbering by the Square Set System at Rossland, B. C., by Bernard MacDonald, Rossland, B. C.
6. A Comparison of Costs for Compressing Air by Steam and Electric Powers at Rossland, B. C., by Wm. Thompson, Rossland, B. C.
7. Safety Lamps and Mine Explosions, W. D. L. Hardie, Lethbridge, Alberta, and Wm. Blakemore, Fernie, B. C.
8. Notes on the Machinery Constituting a Mining Plant, by Alfred C. Garde, Sandon, B. C.
9. Mine Signalling by Compressed Air at Rossland, B. C., by Bernard MacDonald and Wm. Thompson, Rossland, B. C.
10. The Mineral Resources of Vancouver Island, by W. M. Brewer, Vancouver, B. C.

The organization of a British Columbia branch of the Institute will be completed at this meeting.

DEMAND FOR CATALOGUES IN AMSTERDAM.—Consul Frank D. Hill, of Amsterdam writes that it would be advisable for exporters of iron, steel, coal and electrical supplies to send catalogues to that consulate, as he intends to devote a room exclusively to circulars of American firms, folders of American railways, steamship lines, cable companies, etc. He has received many visits of late from people interested in the import trade, and they desire data in regard to United States industries. Reports of chambers of commerce would also be useful.

MOISTURE IN LAKE SUPERIOR IRON ORES.*

Of the 20,589,393 tons of iron ore shipped from the Lake Superior region in 1901 it is to be noted that 88 per cent was of the variety we call soft hematites. If the Chandler and Pioneer products are classed with the soft hematites, then 94½ per cent of the total product of 1901 shipped from the Lake Superior iron mines was of this variety.

All of the soft hematite ores carry a considerable percentage of moisture. In the very complete list of cargo analyses for the season of 1901 we find the product of one mine carrying moisture in its two grades of ore of 17.12 per cent and 16.24 per cent,

10 pounds of water to 1 pound of fuel used. On this basis the removal of 6 per cent of moisture from 1 ton of iron ore would require the expenditure of 13.44 pounds of coal. On account of freight only the best coal is economical at the mines. This may be figured to cost \$3.50 per ton. Therefore the fuel cost to remove 6 per cent of moisture would be 2.51 cents per ton; labor cost would be 1 cent per ton; interest and repairs, 7 mills per ton; a charge of 1 cent per ton would sink the cost of the drying plant in four or five years. I should state that the items of fuel, cost of labor and of interest and repairs were given me by my correspondent, the Cummer Dryer Company, of Cleveland, Ohio. We have no reason to

OPEN CUT MINING ON THE MESABI IRON RANGE.

As noted in the account of the meeting of the Lake Superior Mining Institute published in last week's issue, two of the important mines visited were the Mahoning and Mountain. These two enterprises are probably the best examples of open-cut mining. The former is operated upon a unique system which consist of a series of concentric circles, each circle being on a separate level gradually working outward from the center. There are within the open pit five miles of track. The entire mining is done by steam shovels, which are capable of loading 50-ton cars



MAHONING IRON MINE.

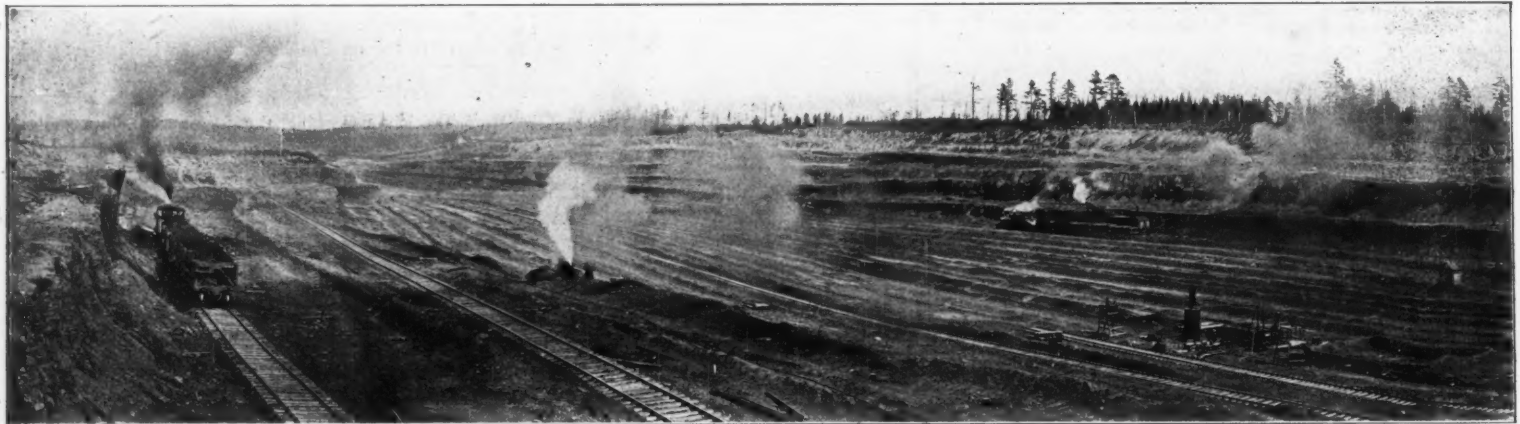
respectively. This list of cargo analyses shows that some 30 different grades of ore carry moisture exceeding 12 per cent of their weight. In addition there are some 62 other grades of ore in the list which contain moisture from 10 per cent to 12 per cent of their weight. The amounts shipped of these high moisture ores are as follows:

	Tons.
Containing 12 per cent and above.....	3,356,242
Containing 10 per cent and up to 12 per cent.....	6,077,737
Total	9,433,979

doubt their correctness. The above items make a total of 4.58 cents per ton. Adding 1.75 cents per ton for fuel for engine rotating the dryers, engineers and cost of bringing the ore to the dryers, and contingencies, and we have 6.33 cents per ton as the total for removing 6 per cent of moisture from ores under consideration. In a plant of magnitude equipped with labor saving appliances I should expect that the cost of drying might be brought down to 6 cents or less per ton.

in four minutes. The lowest level is now 150 feet below the surface and there are still 100 feet of ore below the present workings.

The Mountain iron mine is operated by long, deep cuts, into which the empty cars are brought at one end while the loaded ones are hauled out at the other, there being no shifting necessary in the pit. This mine was the first one to ship ore from the range and has shipped over 6,000,000 tons. The illustrations presented herewith which were received too



MOUNTAIN IRON MINE.

or practically 46 per cent of the entire shipments of ore for 1901.

It has been found that it would not be advantageous to remove all of the moisture from a soft hematite prior to shipment, because of the dust losses which would ensue in handling from mine to furnace, and on account of annoyance from dust in handling.

It may be stated with considerable confidence that 6 per cent of moisture may be without detriment removed from quite all of the soft hematites carrying 10 per cent or more of moisture where the physical structure of such ores show a more or less coarse grain.

This cost of drying the ore to the required percentages of moisture will be made up of fuel, labor, wear and tear of plant, interest and cost of installation. In correspondence had with a firm engaged in building dryers for varied purposes (which firm have had years of experience in such work) they guarantee that dryers of their construction will evaporate

Summarizing the foregoing data, we have:

Saving of freight on Mesaba ore, 14.1 cents per ton; cost of drying, \$0.0633; gain, \$0.0777.

Saving of freight on Gogebic ore, 11.7 cents per ton; cost of drying, \$0.0633; gain, \$0.0537.

Saving of freight on Marquette ore, 10.5 cents per ton; cost of drying, \$0.0633; gain, \$0.0417.

The soft hematites of the Marquette and Gogebic ranges carrying high moisture might, without detriment, have 7 per cent of moisture removed, so that the gain resulting from drying them would be about the same as with the drying of the Mesaba high moisture ores.

Experiments have demonstrated that ore dried, or partially dried, absorbs only a fraction of 1 per cent of moisture from the atmosphere for a long period of time when under shelter.

That the problem of partially drying ores is one well worth profound consideration is seen from the foregoing. Five cents per ton, if saved on the 1901 tonnage of such high moisture ores as I have cited—viz., 9,433,979 tons, would have amounted to \$471,699.

late for last week's issue, show very clearly the method of operations at these two mines.

COAL PRODUCTION OF INDIA.—According to a memorandum received at the London Board of Trade through the India Office, there were 286 coal mines reported to be in operation in 1900, of which 271 were in Bengal. In 1901 it was reported that there were 427 mines in existence, of which 410 were situated in Bengal. During the present year prices have receded, and there has been a pause in the rush to produce which followed, on the competition of buyers. The annual output in all India has been as follows in each of the last five years:

	Tons.		Tons.
1897.....	4,066,294	1900.....	6,118,692
1898.....	4,608,196	1901.....	6,635,727
1899.....	5,093,260		

The prices of Bengal coal in Calcutta have ranged from 6½ rupees per ton in January, 1899, to 7½ rupees per ton in January, 1901. In July, 1901, the price was 7 rupees per ton. The exports of Indian coal to places beyond India are as yet comparatively small.

*Abstract of a paper by N. P. Hulst, read before the Lake Superior Mining Institute.

INTERNATIONAL MINING CONGRESS.

(BY TELEGRAPH.)

BUTTE, Mont., Sept. 4, 1902.

The general prosperity which has prevailed in the mining industry during the past few years is testified to by the larger number of delegates assembled here in convention as the International Mining Congress, which was called to order by President T. A. Shafner on Monday morning. The number of delegates present while not attaining the four or five thousand anticipated, does not exceed greatly the attendance at any previous meeting. There are altogether about 800 delegates here, the strongest delegation in point

ical Survey; "The Undeveloped Mineral Resources of the United States," by Prof. Fulton, University of Mississippi; "What Constitutes a Mine," by Geo. Tower, Butte; "Mechanical Engineering a Factor in the Development of Modern Copper Smelting," C. H. Redpath, Anaconda; "Why Some Ore Deposits Prove Valueless with Depth," by M. W. Alderson, Helena, Mont.; "First Aid to the Injured in Mining," by Dr. King; "Unintelligent Mining," by W. H. Fraser, Mullen, Idaho.

A preliminary meeting was held at 10 o'clock Monday morning. This meeting was brief, as before any business was transacted an adjournment was taken until 2 o'clock, in order to allow the delegates to see

looks upon the fact that several geological survey men are present as an endorsement of the movement to create a Federal Department of Mining. However true his first idea may be, he is greatly mistaken on the latter proposition. Some of the survey men whose field work made it convenient for them to be present have done what these men are always trying to do—giving information freely as their studies have enabled them to acquire it. They are mixing with no political schemes.

The committee on permanent organization submitted its report Wednesday afternoon and created a sensation. It proposes a change of name to the American Mining Congress and that this associa-



MAHONING IRON MINE.

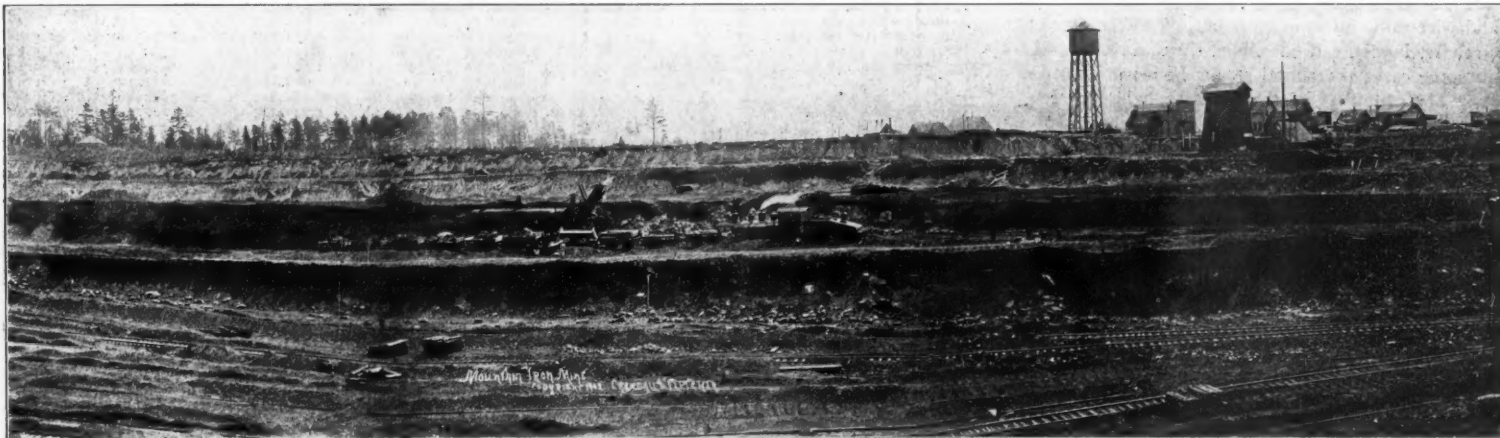
of numbers being from South Dakota. The delegation from South Dakota is composed of strictly mining men and embraces the Black Hills Mining Association, among whom are Hon. E. W. Marlin, M. C.; John Blatchford, superintendent Golden Reward Mining Company; Jack Gray, superintendent Wasp No. 2 Mine; E. M. Holbrook, superintendent Horseshoe Mining Company; S. W. Russell, superintendent Clover Leaf Mining Company; Edward McDonald, mayor of Lead; Ernest Mav. of the

the Labor Day parade. At the afternoon meeting addresses of welcome were made by Governor Toole, Mayor Davey and Mr. J. E. Richards. President Shafner then delivered his annual address. The convention then accepted an invitation from the laboring men to join them in their holiday festivities, and the balance of the day was so spent.

The first regular business meeting was held on Tuesday morning at 10 o'clock, and the afternoon and the greater part of Wednesday were occupied by

tion be incorporated. The report also suggest an initiation fee and annual dues with provision for life membership. Membership to be restricted to persons interested in mining. These and other reforms suggested by the committee and advocated by President Shafner are bitterly opposed by labor delegates headed by Secretary Mahon. Discussion had not been concluded at closing of this report.

A resolution endorsing Senator Kearn's bill for reforming U. S. mining laws was lost.



MOUNTAIN IRON MINE.

Homestake Mine at Lead; Capt. A. J. Simmons, of Deadwood; Otto Grantz, general manager of the Hidden Fortune Mining Company; W. S. Elder, general manager Imperial Mining Company; P. J. Minter, in charge of United States Assay Office; W. S. Warner, of the United States Land Office; Jerry Harrington, capitalist; J. C. Sherman, pioneer of the black hills.

Much interest has been taken in the sessions and in the reading and discussions of the papers presented. Among the interesting papers read at the sessions were the following:

"Geology of Butte," and "Notes on Montana Ore Deposits," by Walter Harvey Weed, of the United States Geological Survey; "Great Expositions as Factors in Promoting Mining Interests," by Prof. J. A. Holmes, chief of the Mining Department, Louisiana Purchase Exposition; "The Application of Geology to Mining," by J. E. Spurr, United States Geological Survey; "Gold Production of North America—Its Geological Derivation and Probable Future," by Waldemar Lindgren, United States Geological Survey; "Topographical Maps and Their Value to Mining Men," by Robert H. Chapman, United States Geolog-

ical Survey; "The Undeveloped Mineral Resources of the United States," by Prof. Fulton, University of Mississippi; "What Constitutes a Mine," by Geo. Tower, Butte; "Mechanical Engineering a Factor in the Development of Modern Copper Smelting," C. H. Redpath, Anaconda; "Why Some Ore Deposits Prove Valueless with Depth," by M. W. Alderson, Helena, Mont.; "First Aid to the Injured in Mining," by Dr. King; "Unintelligent Mining," by W. H. Fraser, Mullen, Idaho.

One of the attractions provided for the entertainment and instruction of the visitors is an elaborate exhibit of Montana and other ores and minerals, arranged with great care and good taste, at the expense of Senator Clark. As usual, one of the principal topics of discussion at the convention is the next place of meeting. There were at first three cities striving for the honor—Seattle, Portland and Deadwood. Seattle's candidacy has, however, been withdrawn, and the struggling has narrowed down to the other two places, with the chances in favor of the city of the Black Hills.

Another important question to be settled is that of the presidency for the coming year. Senator Clark was tendered the honor, but declined. Mr. Shafner is a candidate for re-election, and is strongly opposed by Colonel J. T. Grayson, of Baker City, Ore. President Shafner appears to take the unusually large attendance as an endorsement of his administration, and

Among the prominent people in attendance at the convention are to be seen ex-Governor Hunt and Senator Dubois, of Idaho; Senator W. A. Clark, of Montana; Horace V. Winchell, C. W. Goodale, Professor Leonard, Butte; James Neill, Salt Lake; Dr. Coe and Colonel Grayson, Portland. Mexico is represented by Carlos Selliere and Great Britain by J. J. Cooper, of London.

Among the manufacturers of mining machinery represented are the Allis-Chalmers Company, by F. J. Rowland; Sullivan Machinery Company and A Leschen & Sons Rope Company by Frank Mitchell; Rand Drill Company, by Frederick Harris; Manhattan Rubber Company, by B. S. Gibbs; Chisholm, Boyd & White Company, by C. M. Avery; Goodsell Packing Company, by B. M. Goodsell; Davis Iron Works, by W. C. Davis; Standard Fire Brick Company, by Fred C. Cooley; Lead Lined Iron Pipe Company, of Wakefield, Mass., by T. E. Dwyer; Mine and Smelter Supply Company, Revere Rubber Company and Western Electric Company, by George D. Cochran; American Portable House Company, of Seattle, by Arthur L. Londeregger; F. W. Brown Company, by Mr. Rosslington.

THE CINNABAR DEPOSITS OF THE BIG BEND PROVINCE OF TEXAS.

By ROBERT T. HILL.

The Texas quicksilver district is rapidly increasing its product, and in the writer's opinion bids fair to be one of our most important mercury producing localities.

Several interesting papers have appeared upon the subject, all of which contain useful information. Among these may be mentioned one by Prof. Wm. P. Blake¹ which appeared several years ago before any development had been made in the region; another a good descriptive paper by Mr. E. P. Spalding,² a valuable statistical paper by Mr. E. W. Parker,³ and lastly a description of the location and development by Prof. Wm. B. Phillips.⁴ The present article will only serve to supplement the information already furnished by these writers with a special view of giving more particulars concerning the geology and nature of the ore deposits.

It has now been nearly three years since the writer in making a geological reconnaissance of the Big Bend country had the opportunity of a brief study of the cinnabar deposits there. A realization of the insufficiency of his data for a final presentation has prevented the publication of his observations on the geology and mineralogy, especially in view of the fact that he has been the direct cause of sending several geologists and mineralogists to the vicinity, whose more prolonged study should have enabled them to present a more complete paper. Among these have been Mr. H. W. Turner, Mr. Walter P. Jenney, and several others. Having waited in vain for the appearance of some paper on the geological structure of this most interesting mineral district from more competent authorities, the writer will venture to present the results of his fragmentary observations, in the hope that with the other contributions mentioned they will be of assistance until some mining geologist will present a better description.

GEOGRAPHY.

The Terlingua quicksilver mines are confined to a small area of less than eight square miles, situated in the southwest corner of Brewster County, Texas, within a dozen miles of the Rio Grande. The country as a whole consists of an alternation of desert plains and aberrant irregular mountain groups of both volcanic and sedimentary rocks.

In geographic relations it is the continuation of the eastern ranges of the Cordilleran region of Eastern New Mexico and Trans-Pecos, Texas, as they pass southward into the mountains of Northern Mexico.

The nearest approximation to a correct presentation of the geographic features will be found upon the author's map of Texas published by the United States Geographical Survey, a new edition of which is now in press, and upon a photographic map of the Big Bend in the office of the Survey. Detailed surveys are now being made by the United States Geological Survey.⁵

¹ Cinnabar in Texas. Wm. P. Blake, Amer. Inst. Mng. Engrs. Trans., Vol. XXV, 1895, pp. 68-76.

² Quicksilver Mines of Brewster County, Texas, by E. P. Spalding, ENGINEERING AND MINING JOURNAL, Vol. LXXI, June 15, 1901, pp. 749-50.

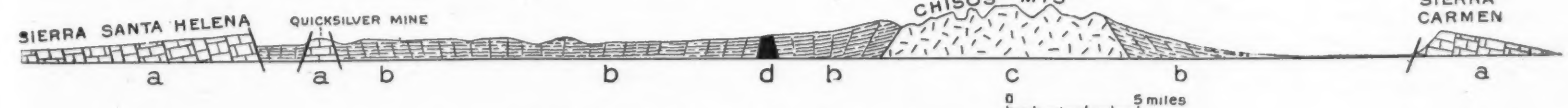


FIG. 2.—CROSS-SECTION OF THE BIG BEND THROUGH LINE a, b, FIG. 1.

a, a, Edwards Limestone, Lower Cretaceous. b, b, Upper Cretaceous Occupying Downthrown Block of the Great Rift. d, d, Chisos Mountains (Volcanic Necks). d, d, Basic Dikes.

³ Quicksilver, by E. W. Parker, Part VI, Twenty-first Annual Report of the Director of the U. S. Geological Survey, pp. 273-281.

⁴ Sulphur, Oil and Quicksilver in Trans Pecos, Texas. By Prof. Wm. B. Phillips, University of Texas Mineral Survey, Bulletin No. 2, pp. 1-43, Austin, Texas, 1902.

⁵ For further information see papers by the author, entitled: "Physical Geography of the Texas Region," Topographic Atlas, Folio 3, of the United States Geological Survey; and the "Geographic and Geologic Features of Mexico," ENGINEERING AND MINING JOURNAL, Nov. 2, 1901, pp. 561, 564. An article in the Century Magazine, for January, 1901, on the Canyons of the Rio Grande also gives a geographical map and description of the region.

STRATIGRAPHY.

In order to understand the cinnabar deposits a combination of stratigraphic, igneous and structural conditions with which they are intimately connected must be explained.

The region as a whole may be described as one of marine Cretaceous sedimentary rocks which have been subjected to tilting, faulting, fissuring, and vulcanism. There are also extensive surficial detrital deposits of wash, and, in the valley of the Rio Grande, much river alluvium which need not be discussed at present.

Inasmuch as the Cretaceous formations constitute the matrix of the minerals (as their induration and relative resistance to erosion influence all the topo-

fossil Rudistes, Requierias, and Gryphaea abound. This is the hard formation of the series of rocks in the region and the one which survives as topographic protuberances in the general lowering of the land by erosion. Its topography constitutes the main surface of the Terlingua fault block, while the Del Rio clays and Shoal Creek limestone are preserved as low hills standing above its general level.

The Del Rio clays, characterized by the fossil *Nodosaria* are only rarely preserved from destructive erosion. There are several small buttes of this formation preserved near the quicksilver mines and a few remnants upon the top of the Santa Helena plateau.

The Cretaceous in this vicinity is notable for the absence of any beds comparable to the Dakota Di-

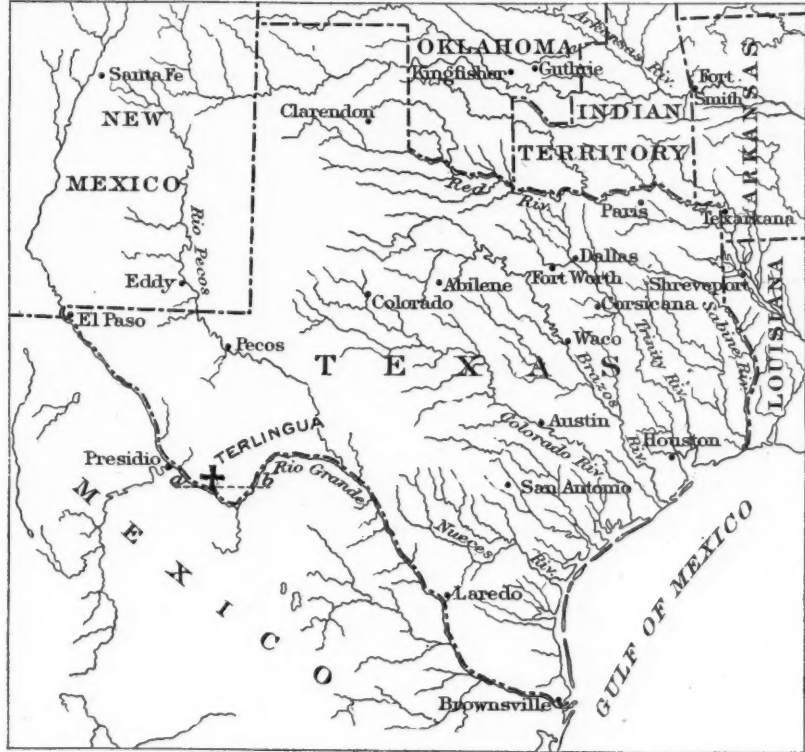


FIG. 1.—MAP SHOWING LOCATION OF TERLINGUA QUICKSILVER DEPOSITS. (a, b, Line of Cross-section in Fig. 2)

graphy, and the structure and composition of the strata, through their manner of opening up upon fissuring and relative affinity for metasomatic replacement has an influence upon the ore deposition), it may be well to give a description of these strata at the outset. The Cretaceous formations¹ are as follows:

Pleistocene and Tertiary		Desert wash and old stream alluvium
Upper Cretaceous:		
Montana Division	8 Eagle Pass	Brownish, ferruginous clays and sands with some lignite and coal, 1,000
Colorado Division	7 Austin	White chalky strata here very thinly laminated..... 500
Lower Cretaceous:		
Washita Division	5 Buda Limestone	Cream white limestone in regular beds 100
	4 Del Rio Clays.....	Impure brownish clay and sandstone shales..... 200
Fredericksburg Division	2 Georgetown Limestone	Massive white limestone with Gryphaea beds at top, and flint nodules below.....1,500
	2 Edwards Limestone	
Trinity Division	1 Concealed	

The Montana beds, which contain lignite and thin

In this portion of Texas the Georgetown (Fort Worth and) and Edwards limestone (No. 2 and 3) practically constitute a continuous formation of massively bedded white limestone nearly 1,700 feet of which are exposed in the Santa Helena Canyon, a few miles west of the Terlingua camp. Flints and

coal seams in places, occupy the valley to the west of the camp and are conspicuously developed around the Chisos Mountains.

The foregoing formations, relative to the topography may be divided into two groups, the hard and durable limestone, and the soft and friable argillaceous beds. There are two hard durable limestone units—the Buda and the combined Georgetown-Edwards. The former is a thin formation which being

¹ For the author's final descriptions and classification of the Cretaceous formations of Texas, see Twenty-first Annual Report of the Director of the U. S. Geological Survey, Part VII, Washington, 1902.

even and underlain by friable beds rapidly degrades upon erosion stripping to its surface, being usually found as a remnantal cap rock above subcircular buttes, the slopes of which are composed of No. 4, resting on a broader platform of No. 3. The latter, owing to its great thickness and depth beneath the surface, constitutes the chief and most important mineral matrix. Being a hard massive resistant formation, it survives longer the lowering process of erosion and is very thick, and hence constitutes the mass of the stratified mountains of the region. Numbers 7 and 8 are soft and friable, are completely removed by erosion from the mountains, and are preserved only in the intervening basin deserts.

DEFORMATION.

The Cretaceous strata have been greatly deformed and disturbed, so that instead of lying in horizontal sequence, they are tilted and broken by faulting, chiefly into monoclinical blocks, the upper strata in cases being brought down to a lower level than the older. Furthermore, they are frequently cut through by igneous necks and dikes, and in the deserts concealed by great thicknesses of surficial debris. These disturbances aided by erosion and uplift have resulted in a residual topography in which the hardest strata have survived as the protuberances, occurring

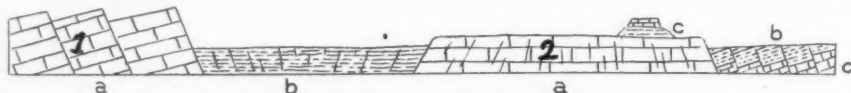


FIG. 3.—TERLINGUA QUICKSILVER REGION.

1. Santa Helena Plateau. 2. Quicksilver Fault Block. a, a, Edwards Limestone. b, b, Upper Cretaceous. c, Buda Limestone and Del Rio Clays.

along monoclinical ridges and plateau of lower Cretaceous limestone and igneous rocks, separated by flat deserts composed of softer upper Cretaceous material and desert debris through which rise numerous necks and dikes.

The Chisos Riff.—The chief factor in producing the topography of not only the Big Bend country, but of all the Trans-Pecos region between the Rio Grande and the Pecos, has been a series of faults extending approximately N. 30° W. These faults are of remarkable continuity, and frequently of opposing throw.

As a result of this fault system the arch of the continuation of the eastern marginal area of the Cordilleran region represented in the Big Bend country, primarily a great anticlinal uplift, has fallen in, resulting in a broad area of relatively lower lying desert (the Terlingua desert) composed largely of upper Cretaceous strata, intruded through by igneous necks, and bordered on either side by monoclinical mountains of lower Cretaceous limestone, presenting opposing scarps facing the desert, while their summits slope away from it.

This downthrown belt of the Terlingua desert is a structural feature which I have named the great Chisos Riff, is some fifty miles wide and lies between the western face of the eastward sloping Carmen-Santiago monocline on the east and western face of the westward sloping Santa Helena monocline on the west. The quicksilver deposits are situated near the western edge of this Riff valley. A few miles west of the quicksilver mines the main western fault scarp, that of the plateau of Santa Helena, presents a vertical throw to the east of over 1,000 feet as shown in figure. The top of the Montana formation here occurring at the foot of the scarp is faulted down opposite the base of the Edwards limestone which constitutes the scarp and summit of the plateau.

While the above is the broad type of the structure of the region, there are variations and modifications of the general detail, including later movements in opposite directions. All of these can not be amplified here, but some of them must be explained as they have an important bearing on the immediate geology of the quicksilver deposits.

Riffs within the Riff.—The first of these secondary structural features are minor riffs within the greater riff, whereby belts of country are faulted up or down in the direction of the major N. 30° W. trend. It is upon a narrow upthrown block of this kind, situ-

ate about five or ten miles east of the great Santa Helena mother fault, that the cinnabar beds are situated, as shown in Fig. 2. This block is composed primarily of the harder Edwards limestone, bordered on the east and west by the softer upper Cretaceous strata, small patches of which still survive upon its summit.

A third and most essential detail of the structure is a zone of secondary and later fissuring and movement along east and west lines—or in a direction complementary to the major trends, and it is this minor feature which has the most intimate connection with the mineralization.

Igneous Phenomena.—The faulted area of the great riff is also accompanied by a most remarkable diversity of igneous phenomena, consisting of necks, dikes, fissures and eruptions of many rare types of igneous rock, specimens of which are now in the hands of Mr. Whitman Cross of the U. S. Geological Survey for petrographic study.

While no igneous rocks are encountered immediately within the mineralized ground the surrounding country is the site of some of the most remarkable igneous phenomena in America. About two miles north of the mines there is a conspicuous volcanic neck. Some ten miles to the west the eastern edge of the great Bofecillos fissure eruption and flows are en-

countered. Twenty-five miles to the east are the remarkable volcanic necks of the Chisos Mountains rising some 5,000 feet above the plain, while between them and the quicksilver country are many later necks, stocks, and motticules of more basic igneous rock. To the northeast about twenty miles are the groups known as the Agua Fria and the Chinatis, consisting of necks and dikes, the latter extending in a course subparallel to the quicksilver fissures.

MINERALIZATION.

Bearing in mind that the quicksilver deposits occur upon the surface of one of the narrow upthrown fault blocks of the great riff, we can now proceed to a discussion of the mineralization. The country rock is almost entirely the Edwards limestone formation of the lower Cretaceous, which constitutes the surface plain of the fault block and continues without material change in texture below ground for at least 1,500 feet. Upon this plain are buttes and hills of Del Rio clay and Buda limestone into which the cinnabar may extend, but these are of secondary importance.

The mineralization is of a type frequently encountered in Mexico, but one which seems to be unfamiliar to many American miners whose practical experiences have been gained in regions where the ore bodies occur in district veins or fissures. Briefly stated, this Mexican type of ore occurrence consists of irregular bodies of ore called pockets, pipes, mantillas, etc., which are the result of metasomatism or replacement in a favorable matrix along line of fissure which are so inconspicuous or irregular compared to the great ore bodies that they are apt to escape any but the eye of the trained geologist.

The mantillas (a Mexican mining term equivalent to the word pocket in Western mining parlance) so far developed, occur almost immediately at the surface, and are irregular in shape, usually longer than broad, and sub-cylindrical or flattened in cross section. Some of the pockets were estimated to contain at least 200 tons of pure cinnabar at the time of my visit.

These pockets all occur adjacent to parallel, vertical fissure veins cutting through the horizontal sedimentary formations of the fault block. Formerly there was some doubt as to these veins, and the present miners who have been largely men of little previous experience, still have an impression that the ore pockets are local and superficial, and have hesi-

tated to sink boldly for other deposits which one would naturally expect to find in the favorable matrix below the surface.

Prof. Wm. P. Blake whose otherwise excellent studies were handicapped by the lack of development work, and slightly confused by the residuary iron of the Del Rio clays (Nodosaria beds) which characterize that formation through its hundreds of miles of extent also left some doubt upon this subject. He stated¹:

"This linear distribution of the cinnabar is indicative of a vein-like occurrence, or it may be the result of a cropping of a certain bed or stratum. The openings which had been made were not deep enough to show conclusively the real conditions of occurrence. In some places the appearance favored the conclusion that the ore is interstratified or bedded; in others it seems to occur along a fissure or fault-plane, and it is most probable that both of these forms of occurrence will be found to exist."

Concerning the fissures there can be no doubt, however, for although often no wider than a knife blade or apparently closing up entirely, they are easily traceable from body to body of the ore. Furthermore, their presence is boldly advertised on the white landscape by protruding caps of brown gossan which can be seen for great distances. There are two or three of these gossan capped veins parallel to each other and all the deposits of mineral thus far exposed are beneath them.

These mineral fissures are east and west (N. 72° E. magnetic), are at right angles to the major faulting (N. 30° W), and directly across the fault block. They are clearly the result of a secondary and later series of movements. Nowhere, so far as I am aware,

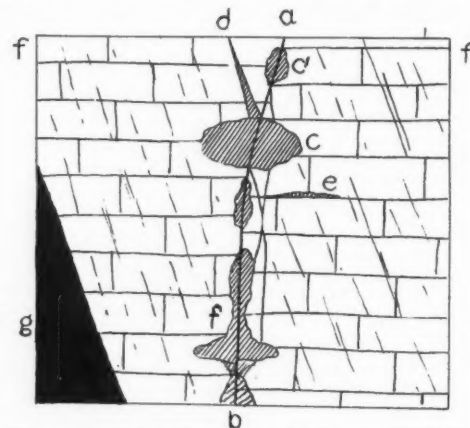


FIG. 4.—ORE BODIES IN EDWARDS LIMESTONE.

a, b, Mineralized Fissures. c, Pocket. c', A pipe. d, A mantilla. e, A chimney. f, A chimney. g, More or less distant igneous intrusions with which the metalliferous solutions have connection.

has the ore been found in the fissures of the major lines of faulting—N. 30° W.

The greater axes of the pockets all extend directly along the line of the minute fissures, which can be traced from one pocket to another, and the pockets are merely replacement phenomena in the more or less pure lime formation constituting the country rock of these fissures. The cinnabar is often present in the country rock along these veins, and even invisible to the eye, until the rock is crushed. In other places particles of metallic mercury can be picked out of the narrowest fissures with a knife.

THE ORES.

An interesting chapter may be written concerning the ores of mercury here found, a subject, however, which has not as yet been minutely investigated. The mass of the ore is cinnabar of unusual richness and purity. It has been noted by Spalding that "very high grade ore occurs in bunches or pockets, assaying from 40 to 78 per cent, while single pieces have been found assaying as high as 82 per cent." The chief gangue, or impurity seems to be carbonate of lime, occurring frequently as calcite crystals in nests and bunches throughout the ore. Sulphide of iron, and its oxidized products seem also to be present.

Mr. H. W. Turner has called attention in Mr. Parker's paper in Part VI of the Twenty-first Annual Report of the Survey, to the fact that in addition to

¹ Cinnabar in Texas, by Wm. P. Blake, Amer. Inst. Mng. Engrs. Trans., Vol. XXV, p. 74, 1895.

cinnabar, mercury occurs in the native form—notably in what has been named the McKinley lode—and as a white coating and as yellow-green crystals. Prof. S. L. Penfield has identified the white coating as calomel, or chloride of mercury (Hg_2Cl_2) and the greenish crystals as oxychloride of mercury, a new mineral species to which Mr. Turner has suggested the name of terlinguaite.

The native mercury was seen by the writer in the small fissures without any apparent presence of ores. In some cases it occurs in the center of small concretions or geodes of iron oxide. It is also visible with the microscope in many hand specimens composed of the yellow oxide and cinnabar. The writer has in his possession a piece of ore which shows not only the red cinnabar, but the yellow green oxides for which Mr. Turner proposed the name terlinguaite, and globules of native mercury.

ORIGIN.

Concerning the origin of these ores there are two theories by which they may be accounted for, 1, sublimation from ascending vapors, and, 2, deposition from ascending alkaline solutions.

The former hypothesis seems to many the more attractive. The occurrence of mercury in the native state would also suggest sublimation. It must be remembered, on the other hand, that this native mercury might be a product of secondary reduction. It is also evident that the replacement in the limestone which has so extensively taken place could not have occurred without the aid of solutions, and hence for the present we must incline toward the latter theory. The aspects of the geology are also such as to support the theory that the source of the metal is intimately connected with solutions derived from the underground continuation of the numerous igneous phenomena so manifest in the surrounding territory.

Another feature which supports the solution hypothesis are the abundant and beautiful calcite crystals which abound and which are themselves the product of aqueous alteration. Furthermore, one beautiful calcite crystal in my possession shows a rich coating of cinnabar interbedded in the facet of the crystal, showing contemporaneous origin of the two minerals from solution.

DEVELOPMENT.

In a recent publication, Bulletin No. 2, The University of Texas Mineral Survey, Professor Wm. B. Phillips gives the following statements concerning the development at Terlingua.

"The development of the district is proceeding as rapidly as possible under the circumstances. The distance from the Southern Pacific Railway at Alpine is about ninety miles, from Marathon eighty-five miles, and from Marfa about 100 miles, most of the freight and hauling going over the road from Marfa. In 1900 the production was 1,750 flasks of quicksilver, and in 1901 about 3,400 flasks, a flask holding about seventy-six pounds of the metal. The flasks are of iron, and are closed with a screw plug. During the year the San Francisco quotations for quicksilver ranged from \$46.50 to \$48.00 per flask for domestic, and about \$42.00 for export.

Practically all of the output to the end of 1901 is to be credited to the Marfa and Mariposa Mining Company, although Parker and McKinney produced some metal in a small furnace on their claims near the eastern boundary of the district. The Marfa & Mariposa Mining Company has been operating a 10-ton Scott furnace, and is now building another 10-ton furnace alongside the old one. The Terlingua Mining Company (Lindheim & Dewees) has recently built a 45-ton Scott furnace, which can be urged up to 50 tons. These furnaces are all of good construction, and some of the brick for them are made within a few miles, the firebrick being brought in from St. Louis. Both wood and water are scarce. Rock tanks are constructed in the canyons for holding the rain water, but borings for water in the flats should by all means be undertaken. At the present time most of the water is being hauled from the Rio Grande, a distance of about twelve miles."

Since the publication of the foregoing the Dewees and Lindheim furnaces have blown in with a capacity of 40 to 50 tons a day.

CONCLUSION.

Although the writer can not explain the reactions, the Terlingua quicksilver deposits seems to corroborate the fact that certain beds of the Edwards limestone have great affinity for the mineral-bearing solutions causing metasomatic replacement and that a study of the minute geologic structure of these limestone formations in mineralized regions will be of great aid in the location of the ore bodies. While the theoretic explanation can not be given, instances are constantly coming under my observation where this formation, an almost pure carbonate of lime with flint (siliceous nodules) constitutes the site of great mantillas, pockets and other aberrant deposits of ore.

Large pockets resulting from the metasomatic replacement in the favorable limestones of the Edwards formation along minute and inconspicuous fissures characterizes at least three widely separated and distinct mining districts which the writer has studied in northern Mexico, to wit the silver mines of Santa Eulalia, Chihuahua, the copper mines near Jimulco, Coahuila, and the silver-lead-iron pockets of Monterey in Nueva Leon.

Inasmuch as the pockets thus far developed at Terlingua are entirely those exposed at the surface by erosion, and inasmuch as the limestone exactly similar to that at the surface extends downward to a depth of probably 1,700 feet, and furthermore inasmuch as mineral conveying fissures no doubt cut the entire thickness of this limestone, there is every reason to believe that similar mantillas and pockets will be encountered in this district throughout the thickness of this limestone by sinking, and deep exploration should be undertaken. If these principles are found to stand the test of time, there is no reason why the Terlingua quicksilver deposits should not prove to be as productive as any hitherto encountered.

The writer is unable to state whether other occurrences of quicksilver have been found in the district, but only one other case has come under his observation. Upon the high and almost inaccessible summit of the Santa Helena plateau, about ten miles west of the present Terlingua camp, a Mexican conducted him to another gossan ridge a quarter of a mile in length, and by scraping with our hands cinnabar was found a few inches below the surface. This vein on top of the great Santa Helena fault block also extends in the east-west direction, or directly across the major fault axis. Other deposits are also said to exist on the Mexican side of the Rio Grande.

The only drawback to the development of the Terlingua region has been the unsatisfactory land laws of the State of Texas. It is hoped, however, that the differences and litigation arising therefrom will soon be adjusted.

MECHANICAL DRAUGHT FOR SULPHURIC ACID CHAMBERS.—O. Mühlhäuser, in the *Zeitschrift für angewandte Chemie*, 1902, XV, xxvii, 672 to 674, pays a well deserved tribute to the efforts of Mr. F. J. Falding, of New York, in promoting the installation of mechanical exhausters in the United States for effecting the necessary draught through sulphuric acid chambers, towers and furnaces, which is considered to be one of the most important improvements of the last 25 years in the chamber process of sulphuric acid manufacture. The use of fans in this connection was first introduced by Hagen, in 1878, at the Halsbrücke works in Saxony, and was developed in an important way by Mr. E. C. Hegeler at the works of the Matthiessen & Hegeler Zinc Co., at Lasalle, Ill. The increase in the use of fans for this purpose has been due, however, largely to Mr. Falding. By it the chamber process acquires a machine-like regularity, independent of atmospheric conditions, and other advantages which have been referred to in the various papers on the manufacture of sulphuric acid in *The Mineral Industry* for 1899, and subsequent volumes.

INSTITUTION OF MINING AND METALLURGY.

A recent circular from the office of the Secretary, Salisbury House, London, contains the following announcements of interest:

The Institution of Mining and Metallurgy Gold Medal.—The Institution gold medal has been awarded, by a unanimous vote of the Council, to Mr. John Stewart MacArthur as the representative of the many workers connected with the gold mining industry whose efforts have resulted in the introduction and development of the cyanide process. The date upon which the medal will be presented to Mr. MacArthur will be announced later.

The Consolidated Gold Fields of South Africa Gold Medal and Premium.—This medal, with the premium of 40 guineas, has been awarded, by a unanimous vote of council, to Mr. Hans C. Behr for his paper on "Winding Plants for Great Depths." The gold medal and premium are offered for the paper of highest merit contributed to the *Transactions* each session, on the mining, treatment or reduction of gold ores. In view of the special interest of the subject dealt with by Mr. Behr and the desirability of insuring adequate discussion, the Council have resolved to leave the discussion open until December 31, 1902, and to publish the paper, with the discussion and notes thereon, in a separate volume.

William Morgan's Premiums.—In consequence of the small number of papers submitted in connection with these premiums, and of the fact that several members have stated that owing to the shortness of time allowed it had been impossible for them to submit papers, the Council have decided to extend the time during which papers may be received to June 30, 1903. The two premiums of 25 guineas each are offered for the best papers on the "Circular and Rectangular Forms of Shaft for Mines of Great Depth." The subject being of special interest, it is hoped that members may be able to submit papers by the above-named date.

Arthur Claudet Students' Prize.—This prize, for 1901-1902, of the value of 10 guineas, has been awarded to Mr. Mervyn S. Stutchbury (student), for his paper on "The Pierrefitte Concentrating Mill." The prize is offered annually to students of the Institution for the best paper submitted during the session (provided such paper is deemed by the Council to be of sufficient merit to be incorporated in the *Transactions*) on any subject connected with the treatment of ore.

Consultative Committee in South Africa.—The following gentlemen have been appointed a committee—with power to add to their number—to advise on all matters affecting the interests of the Institution in South Africa: Messrs. Thomas H. Leggett, Edgar P. Rathbone and Sidney J. Jennings.

A BIG BLAST.—A blast of unusual magnitude was recently conducted with most successful results at the green slate quarries of Messrs. Stephenson & Co., at Tilberthwaite, Cumberland, England. The blast was designed to remove no less than 40,000 tons of rock, standing in front of the quarry, and which for 20 years had formed an impediment to the advantageous working of the quarry. Twenty boreholes, varying from 13 to 18 feet in depth, were drilled in the rock. It was supposed that the main body of the rock rested on a narrow pillar, which extended to the lower floor of the quarry, and it was decided that this pillar should be first blown away, the other holes to be fired shortly afterwards. For this purpose a series of seven holes were bored into the pillar and were charged with a preparation of nitro-glycerine, and specially prepared gunpowder. Several of the holes were bored horizontally in the face of the cliff at a distance of 100 feet from the upper surface, entailing a considerable amount of labor and risk as well as careful judgment on the part of the workers. The various holes were fired in two groups, each group perfectly simultaneously, by means of instantaneous fuse and volley firers, and the time fuses in one case was 4 feet more than in the other, in order to allow for the desired interval between the firing of the two groups of holes.

THE MINERAL RESOURCES OF TURKEY—COAL.

By J. E. SPURR.

Coal was known in Turkey in remote antiquity. Dioscorides and Pliny mention it under the name of "The Thracian Stone," as occurring at Sintia, on the river Pontus, on the Macedonian border of Thrace, to the west of the present Constantinople. Aristotle mentioned that this coal on burning had a bituminous odor; it was used by smiths. Theophrastus observes in this connection that "some brittle stones become, by burning, like glowing coals, and remain so for a long time." This coal, like the others of Macedonia, was undoubtedly lignitic.

European Turkey.—There are three coal mines in a state of feeble exploitation in the province of Adrianople, just west of Constantinople, being respectively in the districts (cazas) of Dedeagh, Kechane and Ouzoun-Keupru. Unexploited coal deposits are reported in the district of Rodosto. Although labor is cheap in these regions (in the neighborhood of 30 cents a day) the development of the mines goes on very slowly. The coals are lignitic, and do not equal the imported article; the roads are poor and other means of transportation are lacking, bringing up the price of the mineral delivered to the consumer, and the miners are for the most part managed by men with little knowledge of the business.

Near the Black Sea coast, north of Constantinople, near the villages Akbrunar, Tchiflik, and Aghatchly, foliated lignite occurs in probably Quarternary sands, and elsewhere is also associated with marls, clays and black siliceous limestones. The seams are 5 centimetres to 1 metre thick ordinarily, but may be several metres. They are not, so far as I know, exploited.

In southern Macedonia or Albania, in the province (vilayet) of Monastir, coal is reported in considerable quantities. In the province of Saloniki large seams of lignitic coal are reported. In Albania coal-lignite has been reported near Triano, and coal at Telvino.

Therefore, European Turkey contains numerous deposits of lignitic coal, probably for the most part Tertiary. Some of these are very feebly exploited, the most of them not at all. On account of the quality of the coal and the nature of the country their profitable exploitation will require great skill and management.

Asia Minor.—The most important coal mines in Turkey at present are those of Heraclia, or Eregli, on the Black Sea coast, not far east of the northern end of the Bosphorus, 135 nautical miles from Constantinople. The coal deposits are of considerable extent, and have been long known. The coal occurs in a strip along the coast, running back from it in three tongues, which have a general southwesterly direction. The coal seams are interstratified with clay limestone and sandstone, carrying carboniferous flora.¹ The dominant dip is E. S. E. 14—40°, but the beds are often overturned or faulted; these faults constitute the greatest difficulty in mining the coal, a trouble which a careful geologic survey of the district would remove at least in part. The seams are from .2 to 2.7 metres thick.

In 1853, and subsequently, coal was exploited in this district in a number of localities between Heraclia and the village of Bartan, under the direction of an English mining engineer.

These mines, after many vicissitudes, are now worked by a French company, the Société d'Héraclée. The mines worked extend over a district containing about 25 square kilometres; 1,200 to 1,500 native workmen are employed, with foreign engineers. The output is about 850-950 tons a day.

A narrow gauge railway connects the mines with the shore. In the beginning of the year 1901, an aerial tramway six kilometres long, and borne by steel supports, was put in operation, and transports 500 to 600 tons a day.

The coal sold for steaming purposes is screened mechanically, and carefully picked by hand. The fragments below 50 millimetres in diameter are then transported to the dressing plant at Longouldak,

where they are screened again, and classified into various sizes by water flowing over bump tables. The fragments up to 10 millimeters are used for coke; from 10 to 18 millimetres for blacksmith coal, and from 18 to 50 millimetres for the manufacture of illuminating gas. The company has put in a briquette factory, which can turn out 300 tons per day if necessary. There are 50 coke ovens in operation since the beginning of the year 1900, producing 120 tons a day of coke of excellent quality. At the shipping port, Longouldak, which the company has improved, and can now be used in any weather, arrangements for rapid loading have been made, by means of jetties on which are cranes which take the full cars and dump them directly into the steamer's hold. In this way 2,000 tons a day can be put on board.

The coal is bituminous, as shown by the following analysis:

Fixed carbon	61.86
Volatile matter	27.47
Ash	8.70
Water	1.50
Sulphur	0.47
	100.00

This coal is in competition with that from Cardiff, Wales. The latter is undeniably better for steaming and domestic purposes, and is used by the Bosphorus Ferry Company of Constantinople. Yet, although rather dirty and of inferior steaming quality, the Heraclia coal is used on the Mohsourse, a line of Turkish steamers at Constantinople, and the captain of a salvage steamer told me he preferred it, since it was only slightly less efficient and much cheaper. Heraclia coal is quoted at \$2.50 to \$3.00 per ton here in quantity. English bituminous coal \$3.75 to \$4.00. The Heraclia coke is quoted at \$5 per ton f. o. b. at the works.

The company ships its coke to Marseilles and Trieste, and supplies the metallurgical works at the mines of Laurium in Greece, of Bolia in Asia Minor; some is also sent to the Russian Black Sea port of Kertch for metallurgical operations. Gas coal is furnished to the works at Athens, the Piraeus, Salonica, Smyrna, Alexandria, Trieste, Bucarest, Galatz, Odessa, etc.

The actual total production is from 850 to 950 tons a day.

The mines of Bolia, in Asia Minor, mentioned above, are lead-silver-zinc mines, and will be described in another article. The company possesses a mine of lignite, said to be extensive, at Mandjilik, about 30 kilometres from Bolia. This deposit is connected with the metal mines by a Decanville tram line with animal power. This mine is in extreme northwestern Asia Minor, not far south of the Sea of Marmora.

Near Soma, between Bolia and Smyrna, and a little inland, coal deposits occur which are said to be the most extensive and important in Asia Minor.

A deposit of probably Pliocene lignite, of no value and of limited extent, occurs 4 miles northeast of Lapsiki, near the Dardanelles. The writer has also examined small pockets of bituminous coal of good quality in the neighborhood of Ismid, east of Constantinople.

In the southeastern corner of Asia Minor, in the Anti-Taurus Mountains, to the northeast of the city of Adana, coal is known to exist. Tchihatcheff and other travelers have reported many float fragments of a superior quality of coal between the town of Sis and the village of Belenkeny. It was also reported that at this time (about 1863) coal was exploited here by an Avchare chief, whose hostility kept strangers from the coal-bearing localities. So far as the present writer knows, nothing further concerning this coal has been brought to light up to the present time.

Syria.—There are numerous deposits of lignitic coal in the Lebanon. The principal localities are in the province of Liban. Some of these mines are worked in a small way by the proprietors of silk-spinning mills for the needs of these. One of the most important mines, at Aim-Amadé, produces some thousand tons a year. Another is situated near Jez-

zine, and produces 500 tons a year. It is reported to be capable of furnishing 10,000 tons a year. This coal is worked open cut, at a cost of some 30 cents a ton. Although of fairly good quality, it is inferior to the English coals, and the lack of good roads from the mines to the cities and ports has thus far prevented its development. The coal beds are reported to be in the Triassic.

Kurdistan.—In the extreme eastern part of the empire, near the Persian frontier, especially in the province of Van, and between the lake of Van and that of Urumdja (Persian), coal has been reported at many points, as, for example, between Khamadan and Tchobanly (Persian territory) and between Kashkal and Gernavig (Turkish). North of Gernavig, near Douane, enormous deposits of excellent bituminous coal are said to outcrop. The inhabitants, who are Kurds, burn dry cow-dung, knowing nothing of the use of coal.

Close to Harpout undeveloped large deposits of excellent coal (anthracite) are reported. Other coal deposits in the provinces of Diabekis and Mamouret-el-Aziz are numerous. There are said to be all qualities, from lignite to anthracite. The most important localities are at Tchimich-Kezek and in the neighborhood of Palon. In both these places the coal is of excellent quality. One mine is 25 kilometres from the Euphrates, the other on the bank of a tributary of this great river. The quantity is great, but none of these mines are exploited.

Armenia.—Near the city of Erzeroum there are numerous coal deposits. For example, 35 miles northwest of here a seam was opened during the summer of 1900, under the supervision of the municipal and military authorities, and a considerable quantity of coal brought in for consumption, chiefly in the barracks. The coal is said to be an indifferent quality of lignite, but it can be delivered in the city at the same price as firewood (\$9.25—\$10 per ton), and will go three times as far. The cost of transportation by bullock wagon is no less than \$5.87 per ton.

Conclusion.—In Asiatic Turkey there are large supplies of coal. Much of this seems to be lignitic or bituminous coal of rather mediocre quality, and yet highly valuable for many purposes. It is probable that there are many deposits more extensive and valuable than the only one being actively worked, that of Heraclia, on the Black Sea.

From reports, it is very likely also that large deposits of coal of superior quality exist. Of great possible importance are the probably Carboniferous coals in the provinces of Adana, Mamouret-ul-Aziz, Darbekis and Van, in a belt stretching from the northeast corner of the Mediterranean east northeast into Persia.

GERMAN METAL EXPORTS.—The exports of iron and steel and manufactures thereof from Germany during the first six months of 1902 show an increase of more than 50 per cent over the corresponding period last year, and of more than 100 per cent over the first half of 1901. The following table shows the comparison by months for the last three years, in metric tons:

—Month—	1900. Tons.	1901. Tons.	1902. Tons.
January	116,100	147,261	282,807
February	120,755	136,720	208,604
March	127,955	173,860	238,972
April	115,969	159,953	237,827
May	134,962	187,233	268,992
June	128,483	189,377	267,440
Total	744,224	994,404	1,503,742

The value of these exports in 1902, however, shows an increase over 1901 of only 22.7 per cent from \$57,143,800 to \$70,852,600.

THE LARGEST CRANE.—What is said to be the largest crane in the world has recently been built for the Kaiser dock at Bremmerhaven. The total weight of the crane, including counterbalance, is 47¼ tons. It is capable of carrying a test load of 200 tons.

¹Tchihatcheff, *Aric Mineure, Geologie*, Vol. 1, p. 715.

INAUGURATION OF THE SMELTING INDUSTRY ON VANCOUVER ISLAND, BRITISH COLUMBIA.

By WM. M. BREWER.

The mineral resources of Vancouver Island have been discussed by the writer in previous communications, and, consequently, it is unnecessary in the present article to refer to these resources except to say that upon Mount Sicker, near the east coast of the island, are located to-day the mines which furnish the bulk of the output of copper-gold ore.

The Lenora Mine has been a shipper since 1899, and up to date has shipped altogether about 30,000 tons of ore. This ore is of a higher grade than the copper ores of the mainland, carrying an average of about 5 per cent in copper, \$5 in gold, and variable values in silver sufficient to appreciably increase the grade of the ore. The early shipments carried higher values, and, with the high price of copper, this ore rarely ran below about \$20 per ton in all values, but these shipments were of ore hand-picked at the mouth of the tunnel, and, in consideration of the excessive freight rates charged between the mine and the smelters, either at Tacoma or Van Anda, it was

agement of the smelter company has taken advantage of every conceivable device by which smelting can be most economically performed, and also in the arrangement of the plant have taken steps to provide for additions, which, it is expected, will be needed within a reasonable future.

There are many arguments to demonstrate that the plant is advantageously located. Although most of these have been referred to by the local press, many of the readers of THE ENGINEERING AND MINING JOURNAL who are not familiar with the local conditions of the coast of Vancouver Island are necessarily ignorant of most of the reasons to which the writer will now refer.

1. The coal and lumber industries on the Island employ quite a large fleet in carrying cargoes to northern and southern ports, but usually the vessels so employed arrive at the island ports in ballast. The establishment of a smelting plant of large capacity will enable many of these vessels in the future to carry cargoes of ore instead of ballast from their home ports to the smelter, and thus insure to the shippers a low rate of freight.

2. The close proximity to the smelter of all the

from Mount Sicker on to the trestles over the ore bins. Another branch has been constructed in the same direction, and almost paralleling the ore road, for the delivery of coke, and still another line of railway has been built following the coast line from near the shore end of the wharf in a southerly direction for the delivery of the product to the copper house on the shore. This system of trackage is all laid with three rails in order to facilitate the transfer of broad gauge cars from the ferry slip on the wharf. The convenience of this arrangement has already been demonstrated in the delivery of machinery which was transferred from the mainland on the car ferry Georgia, thus avoiding the breakage of bulk. The wharf itself is about 750 feet in length, with a depth of about 21 feet at low tide, and contracts have been entered into to extend this wharf into still deeper water, and erect at the sea end the most modern appliances for rapidly unloading vessels. Bunkers of sufficient capacity to accommodate a ship's cargo will be connected with this unloading appliance.

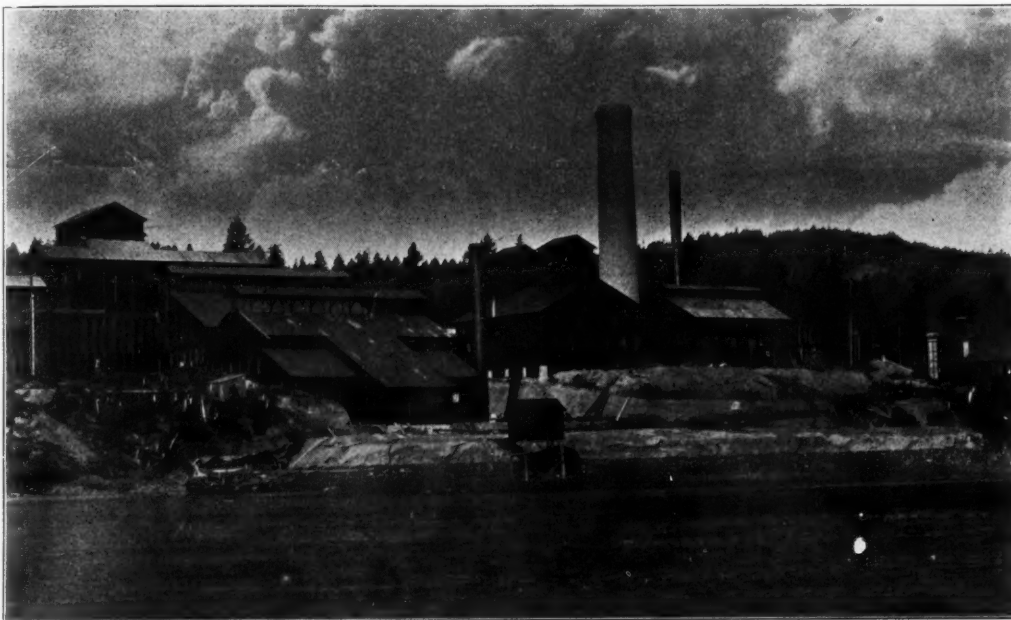
Starting from the wharf, the ore will be carried in cars drawn by the company's locomotive to the point where the railroad branches and near which is located the track scales of the latest design by the Fairbanks Company and having a weighing capacity of 60 tons. These scales have a patent device which registers on a card by perforation the gross and tare weights, so that it is almost impossible for any dispute to arise. From the scales the cars are pushed onto the trestle and over the receiving bins, of which there are six, each bin having a capacity of about 300 tons. The bins are arranged in a line parallel to the sampling mill, with automatic discharge gates about 30 feet distant from the crusher. The crusher is built in a pit in the foundation of the mill. The ore is taken from the receiving bins in ore buggies, again weighed on a Fairbanks platform scale, then dumped into a 9 by 15-inch Blake crusher, and with which is connected the elevator system. After being crushed the ore is elevated to the higher floors of the sampling mill, where it passes through rolls and is automatically sampled, the final sample being delivered on the crushing floor of the mill for transfer to the assay office, situated about 400 feet north of the mill. The remainder of the ore passes through shoots into the delivery bins, arranged in a line parallel to the sampler on the east side. There are eight bins, each having a capacity of about 300 tons, and furnished with automatic discharge gates. The sampling mill is 80 feet high, and has a capacity of 1,000 tons per day.

The distance from the delivery bins to the charging floor of the furnace building, which is situated to the east and nearer the shore line, is about 45 feet. This space is occupied by the coke track and the flooring over the dust chamber.

The dust chamber is 200 feet long, 10 feet wide and 12 feet high, the expansion chamber is 24 by 40 feet and 20 feet high, and the stack connecting with it is a circular brick stack 120 feet high and 12 feet in diameter, interior measurement.

The furnace building is situated with its south side flush with the south end of the dust chamber and sampling mill. It is 73 feet long by 45 feet wide, the charging floor being on a level with the roof of the dust chamber. In this building are three furnaces, the smallest being a cupola for remelting matte whenever desirable, and, of the two larger, one is a water jacket smelter, with a capacity of 350 tons per day; the other is a Garretson furnace having about the same capacity. The Garretson is a new type, by which, with certain sulphide ores, it is said, the quantity of fuel can be reduced from 11 or 12 per cent to less than 3 per cent, while smelting and converting can be carried on in one operation.

In order to secure the advantage of drawing matte from the furnaces and transferring to the converter building by gravity, about 17,000 yards of material have been excavated next to the shore line, so that the floor level of the furnace building is about 14 feet lower than the charging floor and the floor level of the converter building 8 feet lower than the furnace building floor.



CROFTON SMELTER, VANCOUVER ISLAND, B. C.

not considered good policy to ship any but the highest grade ore. As a result of this a dump containing some 40,000 tons of second grade ore has accumulated at the mine, and the management realized that the establishment of a local smelter plant would enable them to ship "run of mine" ore, and do away with the necessity of such close sorting.

In December of last year a contract was entered into between the management of the Lenora Mine and Messrs. Breen and Bellinger, the well-known smelter men, by which it was agreed that if these gentlemen would establish a smelting plant on the east coast of Vancouver Island, at the coast terminus of the narrow-gauge railroad, which has been built by the management of the Lenora Mine, the entire product of the mine should be shipped to that smelter for treatment.

After thorough investigation Messrs. Breen and Bellinger determined to erect a custom's smelting plant on the site proposed, with a sufficient capacity to not only treat the ore from the Lenora Mine, but also all ores which they could purchase in the territory tributary to their smelter. Because of the advantageous location on the coast and on one of the direct highways for all vessels plying on the Pacific coast, it appeared only reasonable that such a plant would grow in proportions far beyond any which the immediate present supply of ore demanded, contracts were accordingly entered into for the construction of the plant to form a nucleus for the building up of the largest smelting industry on the Pacific coast. The following description of the plant, which has been built and put in operation, will show that the man-

necessary fluxes, as well as siliceous gold ores, the latter for use as converter linings.

3. The short distance to the coal mines and coking plants on Vancouver Island, also to those in the State of Washington and to the Crow's Nest Pass coal fields, which, on the completion of the connection between those fields and the Great Northern Railroad, will enable users of coke on the coast to avail themselves of the product from that section.

4. Inexhaustible supplies of timber in the immediate vicinity.

5. The deep-water harbor, in which the largest vessels can anchor with safety, and the deep-water channels which lead into this harbor.

The terminus of the narrow gauge railroad from Mount Sicker is at Osborne Bay, about 40 miles by rail and 50 by water from Victoria. Here a thriving town, designated as Crofton, after Henry Croft, principal owner of the Lenora Mine, has been built up.

The smelting reserve embraces some 30 or 40 acres adjacent to the town on the south. In the latter part of December, 1901, this reserve was covered by a virgin forest. Since that time it has been all cleared, the smelter plant erected and smelting operations commenced.

The reserve is separated from the town site by the narrow gauge railway which has been built from Mount Sicker to the wharf at Crofton. A short distance west from the general office building of the smelter company, which is the most westerly building on the reserve and situated about 1,200 feet from the shore end of the wharf, the line of the railroad branches toward the southeast to convey ore direct

The converter building, which joins the furnace building on the east side, is 73 feet long by 45 feet wide. In this are installed two converters, each having a capacity of 50 tons of matte daily. Adjoining, to the east of the converter building, is the copper room, which, as has been before stated, is connected with the wharf by railroad tracks.

A 50-ton electric crane for handling the converters is installed in the converter building, and a hydraulic elevator has also been installed to handle the slag from the converters up into the blast furnace.

To the north, and within a short distance from the furnace and converter buildings, is situated the power house. The dimensions of this are 50 by 60 feet. In this building are installed a condenser of 1,000 horse-power; two blowers, one a No. 8 (100 revolutions per minute), the other a No. 5 (25 revolutions per minute); blowing engine, 16 by 36 by 42 inches;

of 200,000 gallons, and in pipes from these storage tanks to the smelter plant, the entire system of pipe lines having a length of upwards of 5,000 feet, exclusive of the flume. In addition to this source of supply, the company has acquired 1,000 miner's inches water right in the Chemainus River, which supply can also be brought to the smelter without pumping.

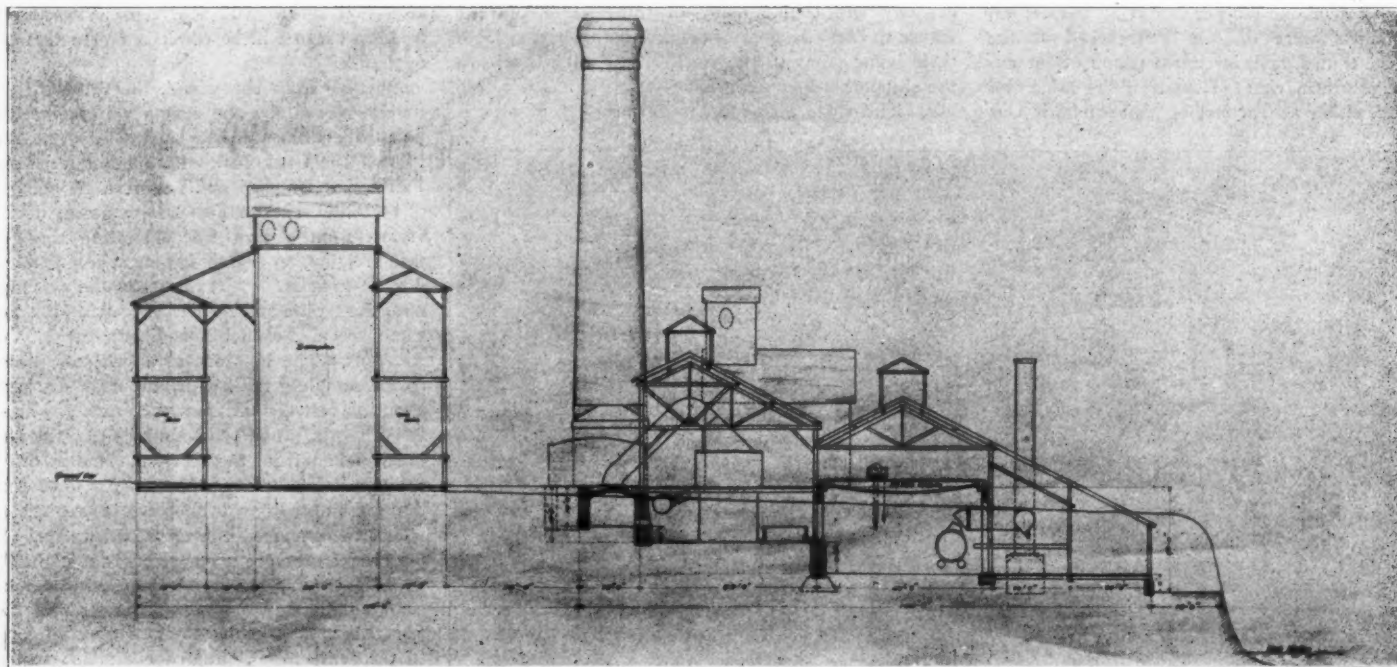
The smelter company is organized as the Northwestern Smelting and Refining Company, with Mr. James Breen as president and general manager, and Mr. Herman C. Bellinger as assistant manager and metallurgist in charge.

With such a management and considering the records these gentlemen have made as successful smelter men in British Columbia, Washington and Montana, there should be no question but that the smelter at Crofton will prove a profitable enterprise, especially when the fact that mining men generally ap-

COMPLETION OF THE "SOO" CANAL.

The great water power canal of the Soo has just been finished, after four years of construction and an expenditure of \$5,000,000. The final stroke of turning the waters of Lake Superior into the channel will be accomplished in a few days after the work shall have been thoroughly inspected by F. H. Clergue, president of the Michigan-Lake Superior Company.

The canal is 2 1-3 miles long, from the mouth of the intake above the rapids to the overflow far below the entrance to the ship canals. The average width is 224 feet, and the depth is 22 feet. The intake has an area of more than 15,000 square feet, through which will flow a volume which is estimated to be 30,000 cubic feet per second, with a velocity of about 2 feet per second, or about 1½ miles per hour. The entrance is 891 feet wide and 18 feet deep. In its excavation some 300,000 cubic yards of material



ELEVATION OF NEW SMELTER AT CROFTON, B. C.

power engine, 18 by 36 by 42 inches, and a dynamo of 50 kilowatts for lighting the entire plant.

The boiler house (40 by 48 feet), in which are installed 3 200 horse-power boilers, with foundations all ready for a fourth when necessary, is located north of the power house.

In a northerly direction from the smelter plant proper and about 400 feet distant is located the assay office. This is one of the largest and most commodious buildings of this character to be found anywhere in the West. It contains a large furnace room, chemical laboratory, balance room, assayers' office and store room. The arrangement of the furnace room affords ample facilities for the representatives of shippers to witness the final operations of sampling and assaying. In fact, great pains have been taken by the management to provide such accommodation for the representatives of shippers as will be deemed most satisfactory by all who have business dealings with the smelter company.

To the west and about 200 feet distant from the assay office is situated the general office building.

From the foregoing description it will be readily seen that in the construction of this plant every detail with a view to compact arrangement of the buildings has been given consideration, and one chief aim has been to insure the most rapid transit of ore and material from point to point, and at the same time to minimize the handling by manual labor, thus securing the most economical operations.

The arrangements for water supply for use in the smelting plant, as well as for granulating the slag, are very complete. A retaining dam has been constructed at the outlet of a lake situated about 2 miles from the smelter and at an altitude of 400 feet above it. From this the water is brought through a flume 1 mile in length to storage tanks having a capacity

of 200,000 gallons, and in pipes from these storage tanks to the smelter plant, the entire system of pipe lines having a length of upwards of 5,000 feet, exclusive of the flume.

The installation of this industry on Vancouver Island does not merely mean profit to the smelter and increasing prosperity to the mining district, but to all the very large lumber, coal and shipping interests on the island. All these interests will be benefited, and within a short time ores mined in such far distant camps as those of Alaska, California, Mexico and South America will be brought here for treatment.

The sampling mill has been running day shift since the latter part of June, and there is already some 6,000 tons of ore being roasted in open heaps, besides which a large supply on hand in the bins awaiting the blowing in of the smelter about September 1. Although the erection of this plant has been completed within such a comparatively short time, it may be stated had it not been for strikes in the manufacturing departments of some of the machinery companies in the United States, which occasioned serious delay in the delivery of the machinery, the plant would have been in full blast July 1.

The boiler plant was made by the Victoria Machinery Depot, Victoria, and some other machinery was also furnished by that company and by the Vancouver Engineering Works, of Vancouver, and the Albion Iron Works, of Victoria, but the smelter machinery proper was furnished by the Allis-Chalmers Company and other firms in the United States.

PATENT FUEL.—One of the largest cargoes of patent fuel ever shipped from South Wales was recently sent from Port Talbot by the Elder-Dempster steamer Montenegro to Mexico. The shipment amounted to 6,000 tons.

were removed. At a point about 1,000 feet east of the entrance the intake merges into the canal proper, the dimensions of which are outlined above. A cross section of the canal at this point measures 4,425 square feet. For a distance of 4,100 feet from this point the canal is cut through solid rock. In cutting out the channel through this rock formation the sides were first cut out by channelling machines. The rock was then drilled, blasted and excavated, and the sides wherever rough were smoothed off with portland cement. The bed was similarly finished. The appearance of the canal bed, before the water was turned in, was as smooth as the exterior of a stone building. For the balance of the distance the canal traverses a formation of sand, gravel and clay, the excavation of which was not attended by such difficulties. From the point where the rock formation leaves off to the entrance to the power house the sides and bottom of the canal have been planked with the best hemlock timber. At a point above the water line the timbering ceases, and the remainder of the sides is paved with rock. The object of planking beneath the water is to reduce the friction, thus securing as large a fall as possible at the point where the water power is secured. The lower 3,000 feet of the canal is on a continuous curve of about 3 degrees. The construction of the portion of the canal which traverses earth necessitated the removal of 1,500,000 cubic yards of material, and 15,000,000 feet of timber were used in the flooring and sides of the canal.

The canal is spanned by five steel bridges, one more is under construction, and others are projected. At the lower end the canal widens out into the forebay, or millpond, for the purpose of securing sufficient frontage for the uniform distribution of the water to all of the turbines, which are installed along the river face of the forebay in the power house.

Because of this expansion the water issuing from the canal will at once disperse and enter the turbines at a velocity of 2 feet per second. The river front of the forebay is closed by the power house. It is constructed of red sandstone, is 48 feet over a quarter of a mile in length, is 100 feet wide and 125 feet high. The building rests upon a foundation of piles covered with portland cement concrete to a depth of 3 feet. The sub-structure consists of 81 masonry walls 100 feet long, 20 feet high and 3 feet thick.

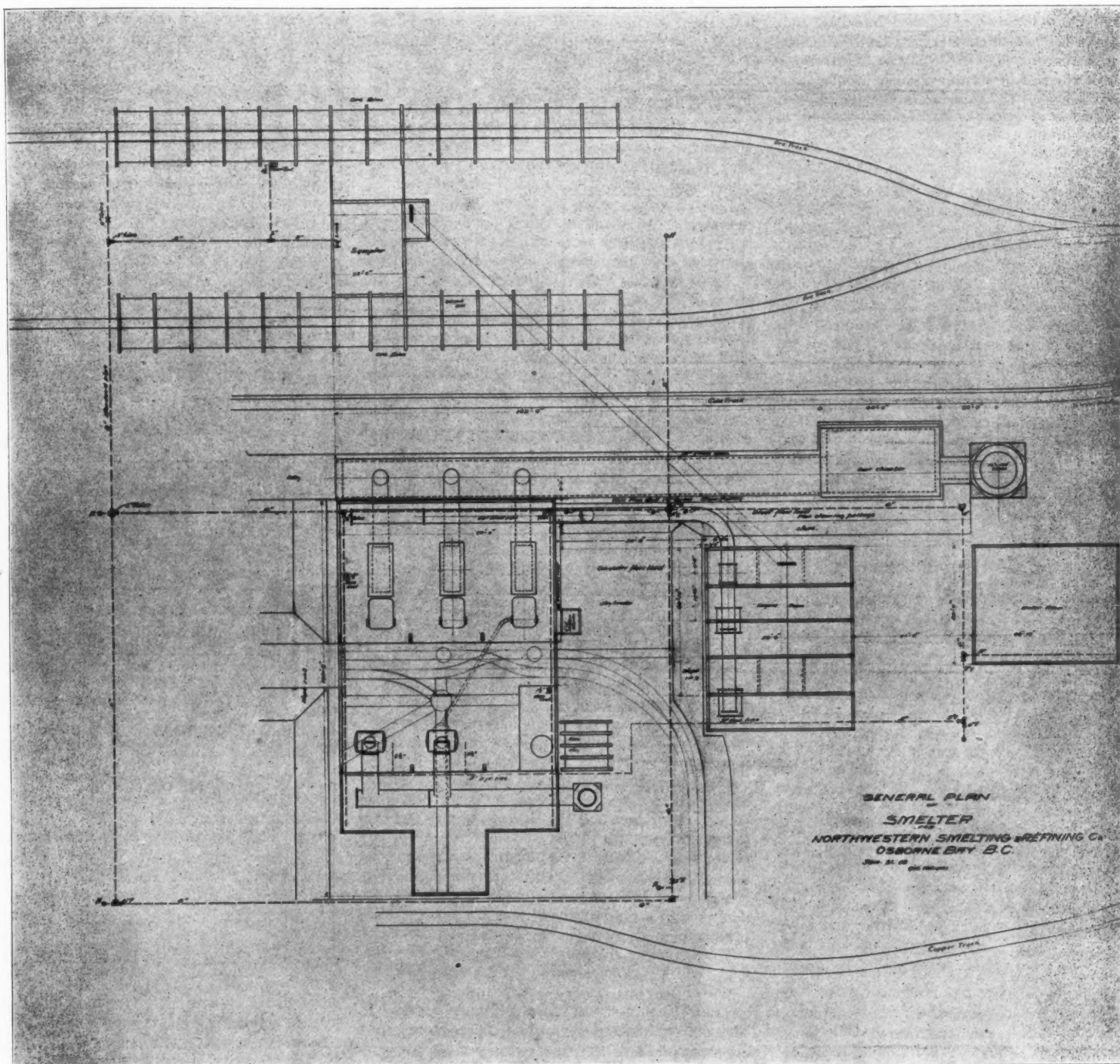
After converting the water power into electrical power the latter will be transmitted by feed wires to the doors of the various plants, which are either in course of construction or projected.

THE METALLURGICAL INDUSTRY OF SOUTH RUSSIA.

According to the London *Engineer*, the great development of the South Russian metallurgical industry, of which such a striking proof was given by the

amount of ore required by Russia amounts to 2,222,220 tons; thus, the local works can look forward to having an adequate supply of raw material for the next fifteen years.

Under these conditions it is not surprising that the more far-seeing ironworkers are now looking out for fresh deposits of ore. Rich deposits have been found in the neighborhood of Kertch, on the Strait of Yenikale, on the Black Sea, and the Briansk Works have started there a smelting works. Moreover, new ore



PLAN OF NEW SMELTER AT OSBORNE BAY, B. C.

The stalls or pits thus formed, aside from supporting the building, serve to deliver the water from the turbines into the river. The penstocks are all of uniform dimensions, 40 feet long, 15 feet wide and 20 feet high. The dynamo floor occupies space on the same floor on the river side of the power house. The floor above is used for the machinery, which converts the energy of the water into electrical power. The energy to be developed by this engineering achievement is estimated at 40,000 actual horse-power, developed by 320 turbines. Four of these turbines in pairs are placed in each penstock. All of the turbines are joined to one high shaft of pressed steel. Thus the power is produced to turn the dynamos awaiting on the floor above. The electrical equipment of the power house consists of 80 dynamos.

formation of so many bubble companies, was due to the deposits of coal and ore in that region. In fact, the coal fields have given such a rich promise of their future output that already the need has arisen of exporting to other countries some portion of this Russian coal. With regard to the deposits of ore in the Krivoirog basin, it was estimated that they would not be exhausted until some time in 1906. But a closer examination of that district has shown that this estimate is wrong, and that the mineral wealth will be exhausted in the near future, when the furnaces will have to be closed. According to the computations made by M. Schimanovski, an expert mining engineer, who has studied deeply the Krivoirog basin, the available ore supply of that district amounts to two milliard poods, or 32,000,000 tons, while the yearly

deposits have been brought to light in the Governments of Kharkoff, Voronezh and Kursk, all of which are in South Russia. But these newly discovered deposits of ore are by no means conspicuous by any especial mineral wealth, so that the hopes of the ironworkers will be directed rather to the Ural and Caucasus regions for their future supplies of raw material; in fact, these latter regions seem destined to supply South Russian ironworkers with their necessary ore. For this reason the ironmasters are now asking for a reduction of the freight tariff on raw ore to South Russia, as thereby the Ural ore would be brought within easier reach of that region. For the latter purpose it is said that the Samara and Zlatoust Railway is to be improved, and its carrying capacity is to be increased by the construction of

several branch lines. In this way the Russian metallurgical industry will return to the scenes of its origin, and will continue there its activity in the very region which saw its birth two centuries ago.

THE SARATOGA, TEXAS, OIL FIELD.

(SPECIAL CORRESPONDENCE.)

BEAUMONT, TEX., Aug. 30, 1902.

Since the wells on Spindletop have ceased to gush and the production to decline, operators and owners of refineries are busily engaged in exploring new fields contiguous to their established interests, and the Saratoga field, which gives every promise of being a paying one, is receiving a large portion of attention. The field is situated in Hardin County, in what has long been known as the big Hardin County thicket.

more probable estimate. Hooks No. 2 is situated 2,500 feet south of No. 1; it is down about 1,400 feet and still drilling. At about 1,000 feet the drill passed through heavy oil sand evidently the same stratum that produces oil in No. 1, but passed through it in the hopes of getting a gusher at a lower depth. Ten feet of oil sand was also passed through at a depth of about 290 feet. There were two blow-outs, the first at 490 feet and the second at 610 feet, but little damage resulted.

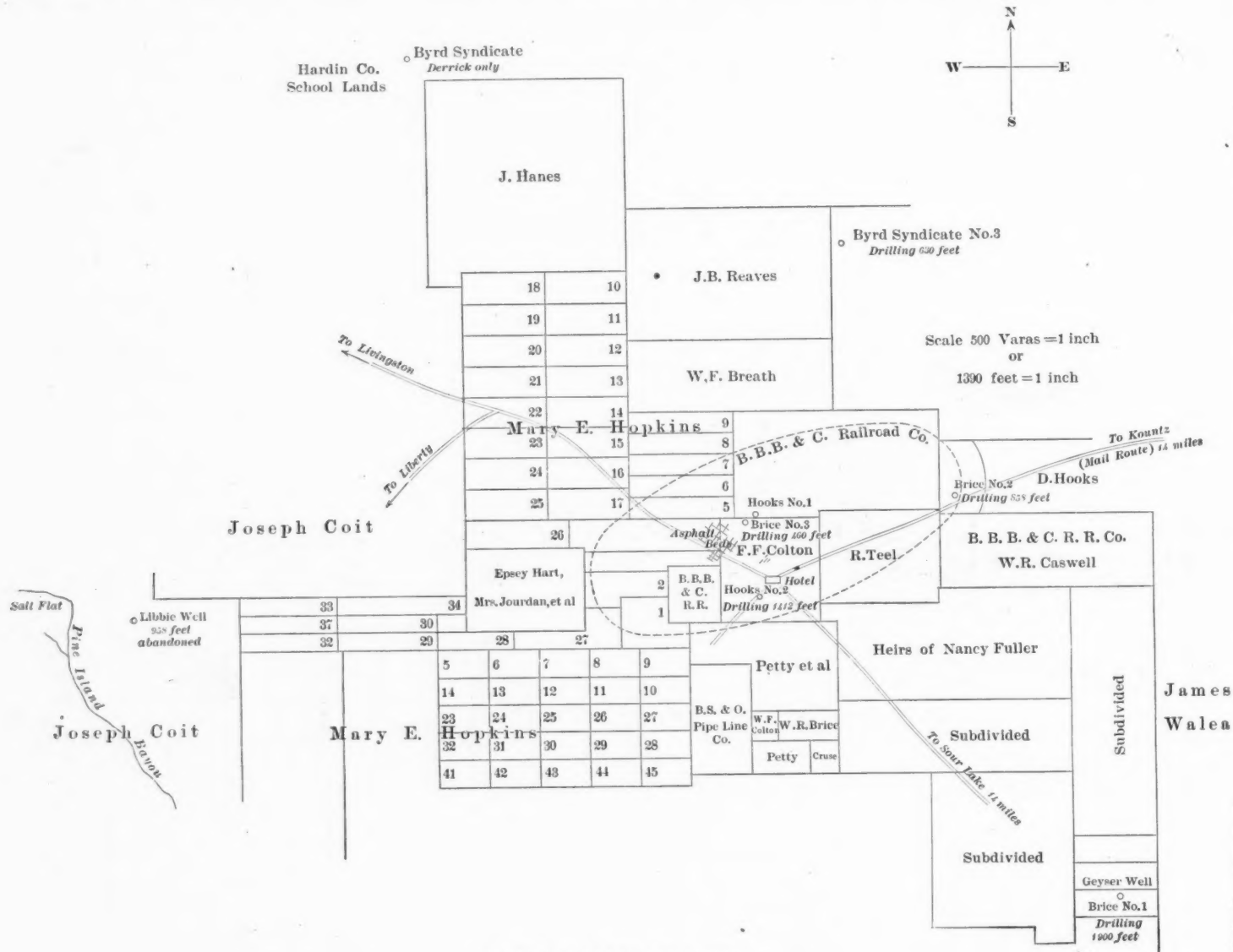
The other wells drilled or drilling are as follows:

The Brice No. 1, on the southern margin of the field, about 3 miles east of Saratoga, which is reported to be over 1,900 feet deep, with no indications of oil as yet; it is evidently too far south.

Brice No. 2, situated about 1½ miles east of Hooks No. 1, 858 feet deep and now drilling in rock.

PRODUCTION OF AMMONIA IN GREAT BRITAIN.

The 38th annual report of Mr. R Forbes-Carpenter, H. M., chief inspector for alkali works, recently issued, gives the statistics of the production of ammonia in the United Kingdom for the year 1901. About two-thirds of the total production is obtained from gas works, but owing to the erection of water-gas plants throughout the kingdom, the output from the coal-gas works last year barely exceeded that of 1900. The ammonia product from shale works and by-product coke oven plants increased somewhat, while that from iron works and producer-gas works decreased. The following table shows the output from the different sources during the last two years in long tons:



SARATOGA, TEXAS, OIL FIELD.

It is a sandy, rolling country, covered with pine, magnolia and ash. Saratoga is 14 miles west of Kountze and 8 miles from the line of the Santa Fé Railway. Surface indications of oil and gas have been known for some years, and in 1895 the Savage well was drilled near the present Hooks No. 1, and produced oil in small quantities; in fact, still does so. The Conroy well, located near the present Hooks No. 2, was drilled at about the same time; it was abandoned at a depth of 250 feet.

Shortly after the Lucas well was developed the Saratoga Oil and Pipe Line Company commenced operations, drilling Hooks No. 1. They encountered sand for about 400 feet, then rock and clay for about 465 feet; the total depth of the well is 998 feet, and is 30 feet in the oil sand. It is a flowing well and is utilized for fuel by other drillers in the field, and forces oil through an inch pipe 2,500 feet to Hooks No. 2 by its own pressure. Its owners claim that it will produce 1,000 bbls. per day, but 500 bbls. is a

Brice No. 3, about 200 yards west of Hooks No. 1, now about 460 feet deep and showing some indications of oil.

Byrd Syndicate No. 3, about 1 mile north of Hooks No. 1, now drilling in sand at a depth of 630 feet; these parties are also preparing to drill about two miles northwest of Saratoga.

The Libbie Oil Company drilled a well 4 miles west of Saratoga, which was abandoned on account of an accident and the loss of the casing. Two streams of hot water were encountered between 900 and 958 feet.

The probabilities are that the field will be a good pumping proposition and that it will be approximately 3,000 to 3,500 feet wide and ½ to 1 mile in length, with an axis so far as determined approximately northeast and southwest. The oil produced is heavier than that of Beaumont or Sour Lake and nearly free from sulphur. An analysis is now being made, but is not yet available.

	1900.	1901.
Gas works	142,419	142,703
Iron works	16,959	16,353
Shale works	37,267	40,011
Coke oven works.....	10,393	12,255
Producer gas and carbonizing works (bone and coal)	6,688	5,891
Total	213,726	217,213

The report goes on to say that in coke oven recovery plants the increase expected has not been attained owing to the depressed condition of the iron industry. The price of oven coke was lowered by this depression, while the price of coal was fairly maintained. Some plants were stopped by this abnormal condition for which, time, it is hoped, will provide a remedy. There is, however, a substantial increase of nearly 2,000 tons of ammonia from this source to record. Increase in the recovery of ammonia from producer gas may be looked for with confidence in the early future, as in various parts of the country, and notably in North Staffordshire, the company formed to promote the erection of Mond producer

gas plants have contracted to erect large installations with ammonia recovery.

Additional progress also has been made, as the result of the year's experiences, in the conduct of operations for ammonia recovery in connection with coke ovens. At the Brymbo steel works, where coke ovens of the Semet-Solvay type have been for several years in successful operation, further improvements in details of working have been made during the year, which have the effect of minimizing any nuisance that is apt to arise during the charging or discharging of the ovens. The washed fine coal is moulded into a cake, before introduction into the oven, in a compressor driven by an electric motor.

Twenty-five per cent more weight of coal is got into the charge, with an ultimate gain of 10 per cent in the output of the oven, the denser charge taking somewhat longer to coke. The time of charging is shortened, as compared with the ordinary method of charging from the top, with levelling of charge by hand labor; this minimizes the low-level smother arising from incipient distillation by the hot oven walls of coal in contact therewith.

An ingeniously devised needle-bath for quenching the incandescent coke when pushed from the oven has been added, one that can be moved from oven to oven, and through which the coke has to pass to the coke bed; a lustre and brightness approaching that of beehive coke is thus attained.

PRODUCTION OF QUICKSILVER.—The production of quicksilver in the United States during 1901 is reported by the Geological Survey as amounting to 29,727 flasks of 76½ pounds, valued at \$1,382,305, as compared with 28,317 flasks, valued at \$1,302,586 in 1900, an increase in quantity of 1,410 flasks, and in value of \$79,719. To the total production during 1901, California contributed 26,720 flasks; Texas, 2,932 flasks, and Oregon, 75 flasks; and of the 26,720 flasks of quicksilver produced in California, 20,950 flasks were received at San Francisco, the remainder being shipped East.

There was very little variation at San Francisco during 1901 in the price of quicksilver, which ranged from \$46 to \$48 per flask for domestic, and from \$44 to \$45 per flask for export.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

MUST PROVE CARELESSNESS OR KNOWLEDGE OF DEFECTS.—Where a laborer is injured by the falling of a stack of spelter, he cannot recover in the absence of evidence that it was carelessly built, or that his employer knew that it was dangerous.—Lanyon Zinc Company v. Bell (68 *Pacific Reporter*, 609); Supreme Court of Missouri.

CONSTRUCTION OF OIL LEASE.—An oil lease which required certain wells to be completed within stated times contained the following: In case no well is completed within thirty days from this date, then this grant shall become null and void, unless the second party shall pay to the first party \$30 each and every month in advance while such completion is delayed. It was held that this did not constitute a promise or obligation to pay rental; that the lessee had the option to complete wells or pay rentals to keep the lease alive; but that upon breach of agreement to complete the wells no action would lie for the recovery of the rentals—there being no promise on the part of the lessee to pay them.—Van Etten v. Kelley (64 *Northeastern Reporter*, 560) Supreme Court of Ohio.

DRAWBACK ON STRIP STEEL.—On the exportation of strip steel manufactured wholly with the use of imported steel billets, a drawback will be allowed equal in amount to the duty paid on the imported material so used, less the legal deduction of 1 per cent. The drawback entry must show separately the number of bundles containing strips of the same

dimensions, the net weight of the same, and the aggregate weight of steel strips exported. In liquidation, the weight of steel billets in condition as imported which may be taken as the basis for allowance of drawback may equal the aggregate weight of strip steel exported, as declared in the drawback entry, after official verification, provided that in no case shall the weight of the several dimensions for each 100 feet exceed by proportion the weights of the corresponding dimensions, per 100 feet. To the ascertained exported weight may be added 5 per cent of the same to compensate for loss incurred in manufacture.—Circular of Treasury Department.

BUHRSTONES—MILLSTONES NOT GRINDSTONES.—Buhrstones is a cellular variety of quartz from which the best millstones are made, and is differentiated in the tariff from sandstone, freestone, and other like varieties of minerals. Millstones made of sandstone or lava are therefore not buhrstones within the meaning of paragraph 116 or 671, tariff act of 1897. Stones which have been hewn, and otherwise partially manufactured so as to be cut in a circular form, with an eye drilled in the center, designed to be converted into millstones by further manufacture, are not "rough or unmanufactured" blocks within the meaning of said paragraph 671. The so-called Derby Peak millstones, made of sandstone, held not to be dutiable as grindstones under paragraph 119 of said act.—Appeals of Naivu Linoleum Company and of W. and F. Livingston from Collector of Customs at New York; Board of General Appraisers.

PREMISES THAT MUST BE KEPT SAFE NOT MERELY INGRESS AND EGRESS.—Where a miner was injured by falling through a platform at the foot of a ladder over which he passed in going to and from his work, and the proceedings showed that the only inquiry concerning the defective condition of the mine was with reference to the platform and ladder, an instruction that it was the company's duty to keep its "premises" in a reasonably safe condition was not erroneous because it did not limit the jury to a consideration of the condition of the place of ingress and egress. An instruction that it should keep them in such condition as they would have been kept by a person of ordinary prudence under the same circumstances, considering the nature of the work to be performed, was not erroneous for not using the words "skilled in the business" after the words "persons of ordinary prudence," the court having instructed in that connection that the company was under no obligation to keep its employees absolutely safe and free from danger, but that its duty was to use ordinary care, which is the care ordinarily exercised by persons of average prudence under the same or similar circumstances. Nor was it error to refuse to instruct that the miner could not walk blindly into danger and seek to hold the company liable, as it is not contributory negligence not to look out for danger when there is no reason to apprehend any.—Downey v. Gemini Mining Company (68 *Pacific Reporter*, 415); Supreme Court of Utah.

WHEN FELLOW SERVANT PERFORMS THE WORK IMPOSED ON EMPLOYER.—In an action for the death of a miner, the evidence showed that deceased was assisting in making an extension of a pipe connected with a pump used in keeping a mining shaft free of water, that he had assisted in placing two stulls some distance from the bottom of the shaft, and that one was securely fastened, but the other was not. There was testimony that the principal timberman, who was assisting or had charge of the work, sent one of the workmen to the pumpman to ascertain how far apart the stulls should be placed, and he replied that one could not be permanently fastened until the pipe was put in, and that the timberman cautioned the pumpman to be sure and nail the stull when they got their pipes down through. It did not appear that the timberman had anything further to do with the work. Subsequently inquiry was made of the pumpman if the unsecured stull should not be nailed, and he replied that he would do it. The stull afterwards fell, killing the deceased. The foreman of

the mining company testified that putting down the pipe was a part of the pumpman's duty, and that the work was under his supervision. It was held, that there being evidence tending to show that the pumpman occupied the position of vice-principal, so far as the work was concerned, a verdict in favor of the plaintiff was not open to criticism that there was no evidence of negligence on the part of the company.—Carleton Mining and Milling Company v. Ryan (68 *Pacific Reporter*, 279); Supreme Court of Colorado.

CONSTRUCTIVE ADMISSIONS AS TO CLAIMS.—On December 12, 1895, a party located a mining claim. On January, 1896, another located same claim. In a suit by one of them to quiet title the issue was whether a prior location was existing at the time of the location in December, 1895, so as to invalidate the latter. On January 27, 1900, he filed location notices with the declaration that they constituted "a re-location of the ground formerly located by unknown parties, and abandoned in 1895 or 1896." It was held that the filing of such re-location was an admission that his location of December, 1895, was premature. Other mining claims may be properly used in a mining location to designate the boundaries of the claim, as it is a sufficient reference to natural objects and permanent monuments to comply with the statute in that respect. A party contesting the validity of a claim described by reference to other claims on the ground that the latter have no existence has the burden of proving such allegation. The burden of proving each location is upon each claimant of the respective locations. Where one defends in such action and sets up claim of title the court must pass upon the validity of his claims as well as those of the one bringing the action.—Shattuck v. Costell (68 *Pacific Reporter*, 529) Supreme Court of Arizona.

ABSTRACTS OF OFFICIAL REPORTS.

Tyee Copper Company, British Columbia.

The report of this company for the year ending April 30, 1902, as issued from the London office, shows that a total sum of £25,414 has been spent on development work. The balance on hand in cash and supplies at the close of the year was £25,625.

The directors' report says: "The developments at the mine during the past 12 months have exceeded the best expectations of your directors, both as to the quantity and quality of the ore exposed by the operations, and confirm the great value of our property. The aerial tramway to connect the mine with the Esquimalt & Nanaimo Railway is expected to be completed and in working order shortly. The smelter site is now ready for receiving the plant from the manufacturers, the ground having been cleared of timber and graded for its erection. It is hoped that smelting operations will commence during the month of September."

Batopilas Mining Company, Mexico.

The report of this company covers 11 months ending December 31, 1901. The receipts from mine products were, in Mexican silver, \$1,502,833; from store, etc., \$35,907; total, \$1,538,740. The total expenses were \$702,395, leaving a balance of \$836,345, which is equivalent to \$395,435 in United States currency.

The total development work done during the year was 11,330 feet, of which 3,016 feet was in the Porfirio Diaz tunnel. The ore taken out and sent to the mills was 21,680 tons, the average value being \$70.16 per ton.

The bondholders of the company have agreed to extend their bonds for five years, and the creditors have agreed to an extension for three years, with semi-annual payments. These arrangements will enable the company to settle its obligations and continue operations on the present scale.

The report of General Manager Alexander R. Shepherd says: "In October and November, finding our concentrations running too high in native sil-

ver to treat by lixiviation without great loss in roasting and leaching, we began a change of treatment. By re-washing the concentrations over and over again we succeeded in raising first product to 5,000 oz. and 8,000 oz. per ton. This permitted the shipping of these high grades along with the sulphides to the reduction works in the United States, leaving the low grade concentrations, containing little native silver, with a value of from 200 to 300 oz. per ton, which are treated with but little loss in roasting furnaces with first-class tailings and washings with an average value of 150 oz. per ton. The returns from reduction works in the United States on concentrations are not yet in, but in any event it will result in a great saving, besides the labor, wood, salt, sulphur and lime used in roasting and chlorination. The average loss in talings of ores averaging from 130 to 150 oz. per ton is 10 per cent. With the great scarcity of wood and the heavy freights on materials used in leaching and roasting, this change will prove very beneficial to the business.

"Transportation and the lighting of Porfirio Diaz tunnel and hoists for Todos Santos and San Miguel mines have given me much thought during the past year, as they are of vital importance to our future. After reflection I determined to send Mr. Quintard and Mr. Kaufman to examine the subject in the States at various mines and works in order to act understandingly and get the best results possible. I was loath to use water power for electrical hauling, as it would have meant the loss of power from our stamp mill which should be augmented instead of decreased. After viewing hoisting tramways, they recommended using gasoline hoists and motors, which I have adopted. Mr. Geo. J. Weber, president of Kansas City Gasolene Motor Company, came here and spent a month planning to adapt for gasolene engines such parts of our present hoists as could be available, and it resulted in giving him a contract for changing hoists in San Miguel and Todos Santos mines, a gasolene engine and dynamos for lighting Porfirio Diaz tunnel from mouth to the entrance of Penasquito tunnel with electric lights, and a locomotive motor for moving the ore and rock of tunnel and veins as well as two small engine hoists now in use in pozo Consolacion which have done good work. The main portion when installed will put us in good working condition. This arrangement will allow us to increase our stamps in Hacienda San Antonio to 100, which has always been my desire, and work on new stamps has begun. The use of gasolene for all our engines when complete will effect a considerable saving. No other power is available in the tunnel, as there are no flues or workings available without injuring mine development. I anticipate a good result from this arrangement and contract as it will permit the use of drums and gearing now here, which are in perfect condition and easily adapted. The wood problem is our most difficult one at present, costing \$15 per cord, with a very scant supply, the hills having been stripped during the past 20 years and bringing it in on mules has been more than difficult—almost impossible.

"The question of a cable is under consideration, but will have to be postponed until we have nearer railroad communication before deciding upon the fuel question definitely. I have put a gasolene house in Hacienda San Antonio, and proper precaution is taken against accidents. Judging from our experience with the small hoists in use, I think we have hit upon the right thing.

"The Todos Santos vein and tunnel connections, in my opinion, will absorb the capacity of the company for years. It is hard to estimate their extent and value. In which ever direction we have worked silver in paying quantities has been found, and if the experience of the past proves again true, the junction of the Roncesvalles and Todos Santos veins should be very productive. I have several gold workings under way and still have faith that we shall find gold in paying quantities in this locality. The high rate of exchange continues without prospect of favorable change, and renders important every possible effort in the direction of gold development."

BOOKS RECEIVED.

In sending books for notices, will publishers, for their own sake and for that of book buyers, give the retail prices. These notices do not supersede review in a subsequent issue of the ENGINEERING AND MINING JOURNAL.

United States Geological Survey. Production of Flint and Feldspar, in 1901. By Heinrich Ries, Pages 9. *Production of Platinum in 1901.* By Joseph Struthers. Pages 5. Washington; Government Printing Office. Pamphlets.

Western Australia Geological Survey. Notes from the Department Laboratory. By Edward S. Simpson, Government Mineralogist. Perth, W. A.; Government Printer. Pages, 90; illustrated.

A Classified List of Minerals, Precious and Other Stones. By Felix J. Troughton. New York; the Abbey Press. Pages, 28. Price, 50 cents.

United States Geological Survey. Twenty-First Annual Report. Part V. Forest Reserves. Compiled under the direction of Henry Gannett, Geographer. Pages, 711; illustrated. *Part VII. Geography and Geology of the Black and Grand Prairies, Texas.* By Robert T. Hill, geologist. Pages, 666; illustrated. *Geology and Mineral Resources of a Portion of the Copper River District, Alaska.* By Frank C. Schrader and Arthur C. Spencer. Pages, 94; illustrated. Pamphlet. *Reconnaissances in the Cape Nome and Norton Bay Regions, Alaska, in 1900.* By Alfred H. Brooks, George B. Richardson, Arthur J. Collier and Walter C. Mendenhall. Pages, 222; illustrated. Pamphlet. Washington; Government Printing Office.

BOOKS REVIEWED.

Queensland. Annual Report of the Under Secretary for Mines. 1901. A. R. Macdonald, Under Secretary. Brisbane, Queensland; Government Printer. Pages, 212; illustrated.

We have heretofore given a summary of the important figures from this report, which gives an excellent account of the work done in the mines of this Australian State last year. In addition to the general report it includes the reports of the mining wardens and district inspectors, with much information about individual mines. It is illustrated by a number of views of mines and machinery.

Western Australia Statistical Register. Part VII. Mineral Statistics and Water Conservation. Compiled in the Registrar-General's Office. Perth W. A.; Government Printer. Pages, 72.

This register contains a summary, chiefly tabular of the statistics of the mines and mining districts of Western Australia up to the end of 1901. The record is a complete one, based on the reports which mine operators are required to make by law. The leading position held by Western Australia among the States of the Commonwealth as a gold producer, makes the figures important. A considerable space is also given to records of deep wells and other sources of the water supply, which is of such vital importance to the mining interests of the State.

Register of Mines and Minerals of California, El Dorado County, 18 pages with map. Myo County, 14 pages, with map. Shasta County, 16 pages, with map. Prepared by the State Mining Bureau; Lewis E. Aubury, State Mineralogist, San Francisco; published by the State Mining Bureau. Price, 25 cents each.

We have heretofore referred to previous issues of these Registers for different counties. We have only to add that these like the previous ones, are very complete. The State Mining Bureau is doing good service in issuing them, as they are of much value to miners, investors and others. They furnish a complete record of mining properties, such as can be obtained nowhere else.

Diagrams of Mean Velocity of Uniform Motion of Water in Open Channels. Based on the Formula of Ganguillet and Kutter. Prepared by Prof. Irving P. Church, New York; John Wiley & Sons,

London; Chapman & Hall, Limited. Eleven diagrams, 8 by 6 inches. Price, \$1.50.

These tables include 11 diagrams intended to furnish solution for the question of the velocity of the flow of water under varying conditions as to slope, nature of channel, etc. The range of application is such as to cover all ordinary cases in practice. They will be found exceedingly convenient by all hydraulic engineers and others who have to calculate the flow and supply of water.

Transvaal Mines Department. Report of the Government Mining Engineer for the Six Months Ending December, 31, 1901. H. Weldon, Acting Government Mining Engineer. Pretoria, Transvaal; Government Printing Works. Pages, 50; with tables.

This report is necessarily somewhat limited in its extent by the fact it covers a period during which work was restricted by the unsettled state of the country. At the beginning of the half-year very few gold mines were in operation, though the number was gradually increased; while no mines at all were at work outside the Witwatersrand, with the exception of a few coal mines. The information given, is quite as full as could be expected under the circumstance, and includes many valuable particulars.

A Graphic Method of Solving Certain Questions in Arithmetic or Algebra. Second Edition, 1902. By Prof. George L. Vose. New York: The D. Van Nostrand Company. Pages, 64; with diagrams. Price, 50 cents.

This is a new edition, giving the graphic method of solution of certain problems, which was first suggested by Prof. Vose over 25 years ago. The publishers have brought it out in a convenient form, which will be appreciated by those who are now unable to obtain the original presentation. While not replacing more precise methods of analysis, the graphic method is in many cases a quick and convenient way of solving a problem; while in some cases it interprets clearly results not always plain or readily understood from other solutions.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.

Letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents.

The Olalla Copper Mining and Smelting Company.

SIR: Last winter when, because of the representations made to me by prominent citizens of British Columbia, many of them leading mining men and acting in the capacity of the representative of THE ENGINEERING AND MINING JOURNAL in British Columbia, I sounded a note of warning as to the merits of the proposition put out by the Olalla Copper Mining and Smelting Company, it was not my intention to be drawn into any controversy relative to the question. I imagined from the statements made by the company and the reports it published that it would hesitate a long while before replying to my criticism. But, from the fact that Mr. Watson, of Vernon, an assayer who reported on the properties, and Mr. W. C. McDougal, the general manager of the company, have, after waiting several months challenged my criticisms through the correspondence columns of THE ENGINEERING AND MINING JOURNAL, I am constrained to reply to these gentlemen and shall make that reply as brief as possible and directly to the point.

The great objection Mr. Watson found to my criticism was, that it was unfair because I had not personally visited the property. I stated in my letter that I had the best authority for making the criticism, although I had not examined the properties myself. A portion of that authority was Mr. Watson's own report published by the company, in which he states that at the time of his examination the sur-

face was so covered with snow that shovelling had to be resorted to to uncover outcroppings of mineral and all the development work performed on sixty-three claims, only amounted to some one thousand feet, of which about six hundred was a cross-cut tunnel run in barren material. Under such conditions for a man to assert that he felt justified in stating that the property possessed sufficient value to warrant the flotation of a company capitalized at \$8,000,000 is arrant nonsense, even though a railroad charter authorizing the construction of a line through a sparsely settled country, a townsite in that sparsely settled country, water rights, and a smelting site are included in the proposition. No responsible mining engineer would make such a statement, but as Mr. Watson only claims to be an assayer I presume the public will deal leniently with his statements, notwithstanding the company appears to attach such importance to his reports that it is willing to attempt to secure the capital from the public.

Another authority was the report of the Provincial Mineralogist who made a personal examination in 1901 which has since been published.

The statements in regard to these properties are too long to be quoted in full, but they may be found on pages 1156 to 1159 of the report of the Minister of Mines submitted to the last session of the Legislature. The following quotations will suffice:

In regard to the Bullion claim, after describing the character of the occurrence, the report says: "The manager reported that no gold or silver values of importance had been obtained, which seemed to be confirmed by subsequent assays. The work done exhibited an extensive mineralization, but failed to discover a sufficient concentration of values to entitle the property to be classed as workable in the absence of gold and silver values. The claim has been worked from Olalla, and no buildings have been erected in connection with the property."

The Opulence claim is reported as "supposed to contain native copper, but no samples could be found carrying such. The principle work done on the property consists of a couple of shafts. The deepest of these was reported to be down 45 feet, with a 15-foot drift to the south at 20 feet depth, while the other shaft was down about 30 feet. These workings were partly filled with water, and consequently could not be inspected."

The Eldorado, Surprise and Searchlight claims are dismissed with only a brief reference. As to the Magdala claim: "The work done did not show what the deposit might be, nor enough of its occurrence to form an opinion as to its origin or probable value. A sample of the pyrrhotite taken for assay gave only traces of gold and silver and 1/2 of 1 per cent copper."

As to the Flagstaff: "A carefully taken average sample from the sides, roof and face of this tunnel, which was supposed to be in the ore body, failed to give upon assay any values in gold, silver or copper, while an average sample of the ore pile on the dump gave an assay 3/4 of 1 per cent copper and traces of gold and silver."

The only properties which are commended at all are those contained in the Apex group, the most important so far as development goes. Here fissures in the limestone show "a replacement of the lime by pyrites, arsenical pyrites and chalcopyrite, which certainly gives considerable promise for the amount of work done. A picked sample of the ore herein exposed was taken for assay and gave 7.7 per cent copper, \$12 in gold and 2.8 oz. in silver per ton.

The report concludes a statement regarding the Dividend group, another of the properties, with: "The showing of mineralization on the surface is certainly very large, but the fact of its not being overlaid by rock, coupled with the fact that two shafts cut through it in a very short distance, leads to the belief that the deposit is, here at least, an overflow surface sheet, the origin of which has still to be found. A sample of the pyrrhotite taken for assay did not show any values of commercial importance."

Still another authority for my remarks are the extravagant statements made by the company in their advertisements in some of the New York daily

papers. These statements were so absurd that, when spoken to on the subject, I at first considered it entirely unnecessary to sound any note of warning. It hardly seemed reasonable, to my mind, that any investor would be led to purchase stock after even a casual perusal of the advertisement. But (as they say) "a sucker is born every minute," on second thought, I concluded to send the communication to the JOURNAL.

I did not visit the properties myself during the winter, because I would have encountered the same difficulties as Mr. Watson in his report frankly states he found. I have not visited the property since, one reason being that, although Mr. McDougal was in Victoria during the spring and had ample opportunity to interview me on the subject, he did not do so. I considered the whole matter one of past history, and I have not since had the time to make the trip, which includes a full day's travel by railroad and lake steamer from Sicamous Junction, on the Canadian Pacific Railroad, to Penticton, and a long stage ride from that point to Olalla.

An analysis of the statement made by Mr. McDougal shows a condition with regard to the whole proposition that it is entirely unnecessary for the writer or any one else to visit the property in order to condemn it. He fails to show any reasonable necessity for the building of a railroad for which he has a charter; he fails to show that it is a feasible engineering scheme to construct the road; he fails to show that there is the least reason to imagine there will be any business for the road if it were constructed. Penticton, the eastern terminus, is a small village at the southern extremity of the Okanagan Lake; the western terminus, Princeton, is a small village on the Similkameen River, which in the future may be connected with a railroad from the Canadian Pacific or possibly from the coast or possibly from the Great Northern system. The charter Mr. McDougal has is for a short line which would connect these two points and be absolutely at the mercy of both systems of railroads unless the charter was sold to one or the other of these companies.

He is frank enough to state that from the present showing it is difficult to measure up ore in sight. Of course it is—for the simple reason that there is absolutely no ore blocked out, and the development work, from his own statement, is of such a character that it would be impossible to estimate any given quantity of ore, and it is merely conjectural whether a cross cut tunnel he refers to will ever intersect the ore body, as he hopes. Mr. McDougal also neglects a very important point which the Provincial Mineralogist, in his report, as quoted above, has supplied; viz., the values of the ore.

The smelter site, town site and water rights which Mr. McDougal claims as valuable assets owned by the company would be such in a camp where there are ores susceptible to and accessible for profitable treatment, but should not be considered such in the case of the Olalla company.

The writer is firmly convinced that in the interests of legitimate mining interests of the Province of British Columbia his criticism has been fully justified.

WM. M. BREWER.

VICTORIA, B. C., August 19, 1902.

QUESTIONS AND ANSWERS.

(Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert, nor can we give advice about mining companies or mining stock. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers must send their names and addresses. Preference will, of course, always be given to questions submitted by subscribers.)

Tempering or Hardening Copper.—1. Has any degree of success been attained in modern times in hardening or tempering copper?

2. What governments offer premiums or rewards for a discovery in this art? What is the amount of such rewards? What are the specifications or requirements?

3. Can you give any opinion on this question?—C. J. K.

Answer.—1. Various processes for tempering or hardening copper have been devised, with varying success. None of them, however, has come into commercial use, for various reasons.

2. No government offers any premium or reward for such a discovery. It is a common belief that such rewards have been proposed, but it is simply a delusion.

3. The so-called art of hardening copper is not a matter of importance, because there is no special demand for it. If we were dependent upon copper for cutting tools and other similar purposes we have little doubt that a method of hardening would be found. As we have in steel a material which is not only better for all purposes which hardened copper could possibly serve, but is also much cheaper and in more abundant supply, there is no object to be gained by any process of hardening the latter metal. Copper has its special uses, for which it cannot be replaced at present. These are sufficient to absorb the supply of the metal, and there is nothing to be gained by any process which would enable us to substitute it for a cheaper metal.

Price of Silver in 1890.—What was the highest price of silver reached in 1890—L. L. B.

Answer.—In our answer to this question, given in our issue of August 9 last, we gave the highest price for standard silver in London at 54.625 pence, but did not give the exact date. The Sheffield Smelting Company, Limited, of Sheffield, England, now inform us that the price named was quoted in London September 3 and 4, 1890, being 54.625 pence per ounce for standard silver, .925 fine, or 58.9375 pence for fine silver.

Pyrites.—Will you kindly inform me where I can obtain information as to the following matters: 1. What grade of pyrites is being mined in Virginia? 2. What methods are being used for the concentration of pyrites?—S. T.

Answer.—1. The Virginia pyrites, as now mined, run from 42 to 44 per cent sulphur. They are sold on that basis.

2. The concentration of pyrites is not usually difficult. Various forms of concentrator are used. Almost any good concentrator will free the pyrites from the gangue.

THE SHATTUCK PATENT SOLAR ATTACHMENT.

Wm. Ainsworth & Sons, of Denver, Colo., have placed upon the market a new and improved solar attachment, designed and patented by Orville F. Shattuck, a prominent mining engineer of that city.

The attachment is arranged to fit over the objective end of the telescope in place of the cap, which renders it easily detachable and makes it unnecessary to send a transit to the factory to have it fitted, provisions being made whereby an engineer can give the accurate dimensions required and place his order when in the field, thus effecting a saving in transportation charges and time.

This solar attachment overcomes by its optical construction the polar adjustments so difficult to maintain, being dependent only on the accuracy of the vertical arc and limb, the two most carefully constructed parts of the transit, hence giving results commensurate with the accuracy of the instrument to which it is fitted.

Fig. 1 shows the attachment three-fourths actual size.

For instruments having no vertical arc, a latitude level is provided at small additional expense and is even more accurate than the arc.

The difficulties attendant upon the use of solar attachments, their inaccuracies when not in perfect adjustment, the difficulty of maintaining their adjustments and their unprotected position on the transit, have rightly prejudiced engineers against them.

The reliability of the solar attachment shown here-

with depends upon principles similar to those of the sextant; i. e., that a ray of light which suffers reflection twice in the same plane is bent at an angle with its original direction equal to twice the angle between the two reflecting surfaces.

Fig. 2 shows a sectional view of the plane of the attachment about three-fourths actual size. The main frame AA carries the stationary mirror H and revolves axially by means of a bearing in the cap B which fits over the objective end of the transit. C is a clamp ring used in connection with the clamp and

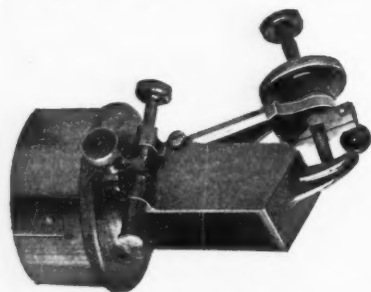


FIG. 1—SHATTUCK SOLAR ATTACHMENT.

tangent screw not shown) for rotating the frame AA about its axis. The movable mirror I is adjustable to any required angle, being mounted on a swinging arm D, which is provided with an adjusting screw E, a graduated differential nut F and a clamp G.

The ray of light enters from above, as indicated by the arrow, and is incident upon the movable mir-

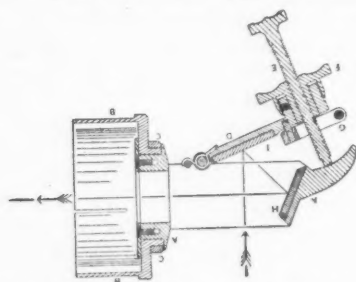


FIG. 2—SHATTUCK SOLAR ATTACHMENT.

ror I; it is thence reflected to the stationary mirror H, thence in through the object glass to the cross wires of the instrument. Thus the maintenance of the angle between the incident and emergent ray depends upon the angle between the mirrors rather than upon the polar bearing.

The declination angle corrected for refraction is



FIG. 3—SHATTUCK SOLAR ATTACHMENT.

set off by means of the movable mirror actuated by the screw E and differential nut F, the method being to sight at some object on the horizon with the solar attachment off, the telescope level and the vernier set at zero. Then with the lower plate clamped and the vernier set at the south polar distance, corrected for refraction, which has been previously computed, sight at the same object with the solar attachment in place, bringing the object into the cross-wires by means of the adjusting screw E and differential nut F.

If the object sighted be less than 5,000 or 6,000 feet distant, allowance is made for parallax.

Fig. 3 shows an operator making an observation to determine the meridian.

After the transit has been set in the meridian the reading of the differential nut is taken and the attachment removed. It weighs less than three ounces and may be carried in the pocket without fear of damage.

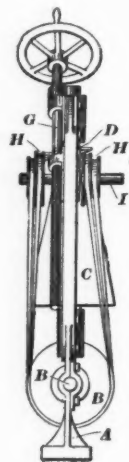


Fig. 1.—End Elevation.

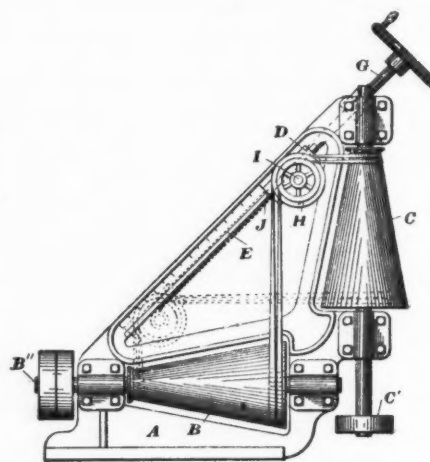


Fig. 2.—Side Elevation.

NEW ERA SPEED REGULATOR.

In taking subsequent observations during the day as a check on the work, it is only necessary to set off the hourly change in declination by means of the graduated differential nut, each division of which represents one minute of arc, place the attachment in position, and if the instrument be in the meridian the sun will come to the proper position on the cross wires.

Catalogue C-8, giving complete description, will be mailed on request by Wm. Ainsworth & Sons, sole manufacturers.

A SPEED REGULATING DEVICE.

A new device for solving the problem of greater convenience in speed variation of machinery is illustrated in the accompanying engravings, which illustrate a speed-regulator invented by Henry P. White, of Kalamazoo, Mich. Fig. 1 is an end elevation, and Fig. 2 a side view, the former having the tight and loose pulleys removed. The inventor has endeavored to provide a speed-regulator of the cone pulley type which may be applied in combination with any desired source of power, and to every class of machines which, in practice, are required to run at various speeds. The design also embodies a construction in which the different portions of the contact surface of the belt travel at the same relative speed upon the surface of each cone, thus avoiding the necessity of a compensating constant slip at the contact surface of the belt.

The advantages which the inventor claims for this improved mechanical speed-regular are, first, its range of variations in speed; second, its spring-regulated belt-tension which acts as a safety governor in the operation of machinery; third, its automatic speed-indicator which enables the operator to know at what speed his machine is running; fourth, the easy and practical means provided for securing any speed intermediate to the two extremes; fifth, its simplicity of construction.

The main frame is indicated by A, and B is the driven cone mounted upon a shaft which carries the tight and loose pulleys, through which power may be applied to the machine. A corresponding cone C is mounted upon a shaft located at right angles to the one on which B is fastened, the pulley C' being the medium by which power may be delivered from the machine. A track E is fastened to the main frame, or is a part of A, having a sliding frame D with a shaft I and idlers H. G is a screw and hand wheel by means of which the sliding frame may be moved along the track E.

The dotted lines show the position of the belts when the sliding frame is moved to the opposite end of the track, and the relative places at which the belts are applied will also indicate the proportionate speeds of the cones. Of all frictional devices used to transmit mechanical force, the belt and pulley has proved the most practical and economical; where the contact surfaces of the belts travel at the same relative speed on all the pulleys involved, there is prac-

tically no loss from friction except in the journals of the revolving portions of the machine. The devices shown embody this feature of such vital import to success in practice.

PATENTS RELATING TO MINING AND METALLURGY

UNITED STATES.

The following is a list of patents relating to mining and metallurgy and kindred subjects, issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the ENGINEERING AND MINING JOURNAL upon receipt of 25 cents.

(Week ending August 19, 1902.)

- 707,088. MAGNETIC SEPARATOR.—Alvin Dings, Milwaukee, Wis. The combination with a rotary, open-ended, non-magnetic cylinder; a series of electromagnets mounted thereon; magnet-cores extended through the cylinder and provided with rounded heads on the interior surface thereof; annular conducting-rings located on the cylinder, and brushes for connecting the same with a source of electrical energy, said magnets being electrically connected in series with rings; a resilient bar for each magnet also electrically connected with the rings, and adapted to serve as a shunt for its corresponding magnet when in contact with a terminal beyond such magnet; and a segmental shoe located in the path of the bar and adapted to force the bar downwardly into contact with the terminal when passing the shoe, said bar being normally out of contact with the terminal.
- 707,107. PROCESS OF TREATING ORES.—John Herman, Canon City, Colo. The process consists in roasting sulphide of copper ore at a low heat to form sulphates of the copper and some of the iron present, and produce a large percentage of ferrous sulphate, leaching the roasting ore, precipitating the metallic copper, and adding salt to the leaching solution, before or after the precipitation of the metallic copper, whereby the ferrous salts in the solution are converted to the chloride and a solution having an excess of salt is produced, and the said solution is adapted to dissolve copper and silver out of carbonate and oxide ores.
- 707,111. COMPRESSED-AIR HEATING APPARATUS.—George W. Hopkins, Cleveland, Ohio, assignor to the Terry Heater Company, Cincinnati, Ohio, a corporation. An apparatus having a hollow air-confining member with inlet and outlet pipes, a delivery tube for the air connected with the outlet pipe and comprising jointed sections, a discharge tip of non-heat radiating material at the end of the delivery tube, and means to heat the air in its passage through said hollow member.
- 707,134. APPARATUS FOR CLEANING AIR FROM SANDBLAST APPARATUS. Jeremiah E. Mathewson, Broad Heath, near Manchester, England, assignor, by mesne assignments, to Benjamin C. Tilghman, Jr., and Richard Tilghman, trading as the firm of B. C. & R. A. Tilghman, Philadelphia, Pa. The combination with a sand-blast plant and an exhaust conduit pipe leading from said plant and adapted to draw dust-laden air from said locality, of an exhaust fan coupled to said conduit, a nozzle arranged to throw a jet or jets of water upon the rotating

blades of the fan, whereby the water is finely divided and thoroughly mixed with the dust-laden air, and a receptacle connected with the delivery side of the fan to receive the mud mixed with the air and permit the cleaned air to escape.

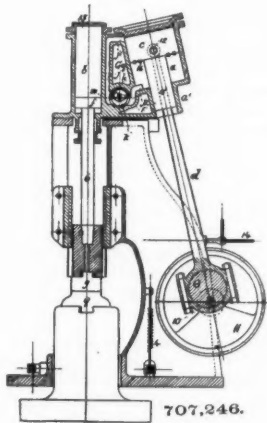
707,146. **GAS PRODUCERS.** Leonard L. Merrifield, Toronto, Canada, assignor to Edwin James Checkley, trustee, and Economical Gas Apparatus Construction Company, Limited, Toronto, Canada. In a peat-gas machine, the combination with a suitable casing and lining therefor and two peat-burning chambers formed therein adjacent to each other and provided with suitable grates, feeding retorts located above the peat-burning chambers and designed to contain peat preparatory to burning, a series of passage ways extending upwardly from the upper portion of each peat-burning chamber circularly arranged and surrounding the retorts, and annular chambers connected therewith, a cross passageway connecting the annular chambers, a series of passageways or flues leading radially outwardly near the bottoms of the peat-burning or fire chambers, annular passageways surrounding the bottom of the chambers and connecting with said radially extending flues and gas outlets from each annular chamber.

707,129. **COMPOSITION FOR MAKING STONES OR MORTAR.**—Jean Loewenthal, Magdeburg, Germany, assignor to the Quarzitol Company, New York, N. Y. A mixture consisting of clean quartz sand eighty-five pounds, pulverized quartz four pounds, alunite one-half pound, magnesia one pound, borax two pounds, graphite one-half pound, mineral colors two pounds, mineral oil poor in carbureted hydrogen one-half gallon and water one-fourth gallon.

707,157. **FURNACE.**—James Reagan, Philadelphia, Pa. Filed May 27, 1902. A furnace having a hollow block independent of the walls, sheets, linings, or grates, and adapted to be removed or replaced without in any way interfering with or changing the walls, grates or supports, and having a vertically disposed tapering passage extending through its body with an opening at the upper end and an inclined outlet to deliver the air into the combustion space above the fire.

707,168. **RECIPROCATING BEAM MACHINE.**—Nelson H. Seelye, Winchester, Mass. In combination a beam, a driving shaft, means connecting the shaft and beam; a power-driven wheel loose on the shaft; a clutch with one member fast to the power-driven wheel and the other member splined on the shaft; a shipping-lever fulcrumed near its middle and connected by its lower arm with the latter clutch member; a treadle connected with the lower end of the shipping-lever, and a cam carried by the beam and operating on the upper end of the shipping-lever.

707,174. **ROTARY ENGINE.**—William F. Stanley, South Norwood, England. A ring-casing having a channel, pivoted flaps extending across said channel from opposite sides and bearing against each other at their adjacent ends, said channel being of tapered cross-section, a piston similarly tapered and having curved sides against which the flaps work.



707,214. **ART OF TREATING REBELLIOUS ORES OF THE PRECIOUS METALS.**—William F. Downs, Jersey City, N. J. A process of treating ores containing precious metals and rebellious elements which consists in intimately mixing the ore with a sodium compound and an agent capable of releasing metallic sodium therefrom, heating the mixture to a temperature sufficient to release the sodium, whereby a combination of the sodium with the rebellious elements of the ore results and leaves the precious metal distributed in a free state throughout the mass, permitting the volatile impurities and compounds to escape and finally recovering the precious metal from the mass.

707,216. **STEAM-BOILER.** Henry A. Duc, Jr., Charleston, S. C. The combination of an internal cylindrical furnace, an annular fire-brick chamber therein having tangentially-arranged passages for the escape of the gases, and means for introducing fuel into said chamber.

707,246. **PNEUMATIC POWER-HAMMER.**—Harold F. Massey, Withington, England. In a pneumatic power-hammer the combination of a pump-cylinder and a hammer-

cylinder with passages to connect the two ends of the one with the two ends of the other and furnished with openings to be opened more or less or closed in order to regulate the flow of air between such cylinders.

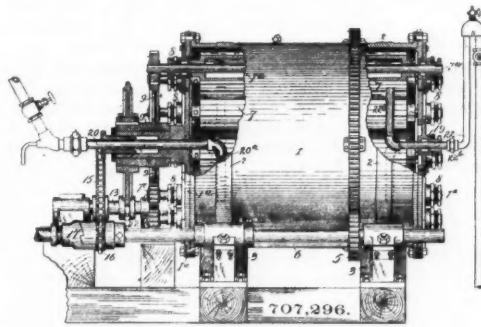
707,272. **METAL-DRESSING MACHINE.**—Flavius P. Stiker, Buffalo, and Orville C. Burton, North Tonawanda, N. Y. The combination with dies constantly rotating in one direction only, and intermittently opening, of a hollow head for the dies, an open tubular spindle vertically located and carrying the head, and a bolt-carrier intermittently rotating in one direction only, longitudinally reciprocating to and from the dies, and adapted to suspend the bolt vertically over said hollow head and spindle.

707,273. **SLIDE FOR METAL-DRESSING MACHINES.**—Flavius P. Stiker, Buffalo, and Orville C. Burton, North Tonawanda, N. Y. A metal-dressing machine having the combination of a barrel having internal circular and radial surfaces, a slide having corresponding circular and radial surfaces and free to reciprocate within said barrel, a plunger-head, projecting centrally from the lower end of said slide, and a carrier supported at one side of the plunger for supporting the object, to be worked upon, centrally under the plunger, the carrier being supported by the slide.

707,275 and 707,276. **BRICK-MACHINE.**—Walter F. Stimpson, Milan, Mich. A brick machine, with a reciprocating cut-off table moved forward by the column of clay and a return device therefor, comprising a crank and a lost motion connection between the crank and table adapted to return the latter in one-half revolution of the crank, and to permit of the free rotation of the crank through the other half-revolution.

707,279. **INGOT-MOLD.**—John E. Sweet, Syracuse, N. Y. An ingot-mold for metal castings, consisting of identical halves finished at the same time in a machine by the same operation, free from all attached means for securing the halves together, each half provided with engaging means fitting the other half for preventing transverse displacement and interlocking means for preventing longitudinal displacement, each upon the other.

707,296. **AMALGAMATOR.**—George H. Breyman, Toledo, Ohio. An amalgamating-machine having the combination of a rotatable cylinder having an axial inlet and axial outlet, means for hermetically sealing the cylinder, means for placing the contents of the cylinder under hydraulic pressure, agitators disposed within the cylinder, operating means



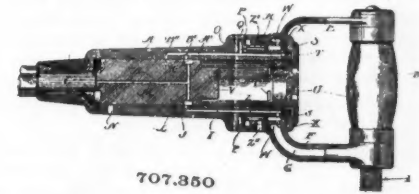
for the cylinder and agitators, separate driving connections between the cylinder and agitators and the operating means, and means for throwing either driving connections into or out of engagement with the operating means whereby both the cylinder and agitators may be axially rotated in unison or the one held stationary while the other is rotated.

707,322. **GALVANIZING-MACHINE.**—Richard Heathfield, London, England. A galvanizing-machine, having the combination of a bath containing molten metal, a pair of clearing-rolls wholly submerged in the molten metal, and a pair of exit-rolls partially submerged in the molten metal, the clearing-rolls being arranged below and in close proximity to the exit rolls in order that after the submerged rolls have cleared away superfluous metal from the sheet undergoing galvanization, the sheet may pass through as little molten metal as possible.

707,332. **SMOKE AND SPARK PREVENTING DEVICE.**—William S. Hughes, Philadelphia, Pa., assignor to Edward A. Willard, New York, N. Y. A device with an arched structure arranged within the fire-box and extending entirely across said structure composed of a front and rear wall commencing at the lower rear corner of the fire-box and extending upward and forward and terminating at a point above the line of the furnace-door, the walls so arranged as to form a gradually-widening passage in between the same, the narrowest portion being at the inlet and the widest portion being at the upper end, the forward wall being provided at the upper end with an opening, a series of nozzles secured to the forward wall and extending through the passage in between the walls, the nozzles being provided with openings therethrough, the rear wall having openings opposite the nozzles, but of larger diameter than the same, a damper or valve arranged at the inlet end of the passage for regulating the supply of air, an opening formed through the furnace-door, a hood secured to the inner face of the door and projecting inward in a downwardly-inclined direction.

707,350. **PNEUMATIC HAMMER.**—Charles K. Pickles, St. Louis, Mo., assignor, by mesne assignments, to Chicago

Pneumatic Tool Company, a Corporation of New Jersey. A pneumatic hammer, having a cylinder containing a live-air passage opening into the piston-chamber by a suitable port, a piston reciprocating in said chamber and provided with a passage whose rear end is brought into communication with the live-air port at the forward end of the stroke of the piston and serves to admit the motive fluid,



through the piston, to the front end of the piston-chamber, to drive the piston rearward, in combination with an independent valve located in a chamber separate from the piston-chamber and operating to control the inlet and exhaust of the motive fluid at the rear end of the piston-chamber.

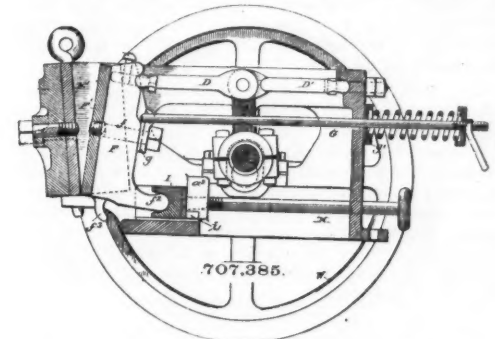
707,341. **SMOKE-CONSUMER.**—Lewis E. Morgal, Washington, D. C., assignor of one-half to Charles B. Cropley, Washington, D. C. A device consisting of a box, a concave diaphragm located in said box and being secured at one end and at its longitudinal edges to the inner sides of the box, and at its other end terminating at a distance from the inner side of the box and leaving a space between the said end and the inner side of the box, a fan journaled at the end of the diaphragm and the inner side of the space between the end of the diaphragm and the inner side of the box, a means for introducing smoke below the diaphragm and a smoke-exit located above the diaphragm.

707,355. **CONVEYING-BELT.**—John J. Ridgway, Rosebank, N. Y. A conveyor-belt adapted to be bent along lines parallel to its length to form a conveying-trough and consisting of a fabric core and an elastic covering thickened



along the lines of flexure between the center and the edge portions of the belt, the center and edge portions of the belt-covering being thinner than such thickened portions.

707,385. **ORE-BREAKER.**—Albert C. Calkins, Los Angeles, Cal., assignor to Frederick W. Braun, Los Angeles, Cal. An ore-crusher, having the combination with an inclosing casing open at one end and perforated lugs at said open end on each side; of a removable jaw having corresponding perforated lugs adapted to register with the lugs of the casing, two pins passing through said registering lugs to



secure the jaw in place, and set-screws passing through the jaw and bearing against the casing to take up looseness in the joints between the jaw and casing.

707,420. **APPARATUS FOR WETTING EMERY-WHEELS.** Elwin R. Hyde, Bridgeport, Conn. The combination with a tank and a reservoir, of a pipe extending from near the bottom of the reservoir to the normal water-line in the tank, an air-pump and a pipe leading therefrom into the reservoir, whereby water may be maintained at the normal water-line in the tank by displacing water in the reservoir.

707,434. **PROCESS OF MAKING PIGMENTS.**—Joseph Lones, Smethwick, England, assignor of two-thirds to Jabez Lones and Edward Holden, Smethwick, England. A process of manufacturing white pigments from zinc ores which consists in converting the ore into crude zinc oxide suitably dissolving the oxide to form a solution of acetate of zinc, precipitating from the solution any lead which may be contained therein, crystallizing out of the solution zinc acetate, suitably dissolving the crystals, precipitating from the solution zinc sulphide and then suitably treating the zinc sulphide to form a pigment.

707,467. **CARBURETER.**—Edward Walther, Washington, Ia. A carbureter, having the combination with a vapor-generator and a gasolene-supply tank both located below the surface of the ground, of a pipe connected to the generator and extending above the ground, the pipe having a detachable cap thereon, a pipe connecting the gasolene-supply tank

and the pipe, a perforated pipe inclosed in the first-mentioned pipe and containing a valve arranged to be operated by the gasolene in the generator to regulate the flow of gasolene from the supply-tank to the generator, the last-mentioned pipe being mounted to be removed to obtain access to the valve.

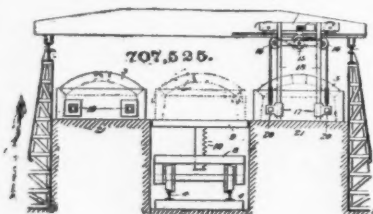
707,470. **SOLDER FOR SOLDERING ALUMINUM.**—Joseph C. Webster, Philadelphia, Pa. A solder for soldering aluminum, which consists, respectively, of from five to six parts of tin, four to five parts of lead, six to four parts of aluminum, and one part of zinc.

707,493. **DETONATING COMPOUND.**—Ugo Alvisi, Rome, Italy. A detonating compound containing fulminate of mercury and perchloride of ammonium.

707,506. **METHOD OF TREATING MIXED SULPHIDE ORES.**—Erminio Ferraris, Montepioni, Italy. The process of decomposing mixed sulphide ores containing zinc, and the production therefrom of zinc sulphate soluble in water, by means of concentrated sulphuric acid without the aid of extraneous heat.

707,510. **LIQUID-FUEL BURNER.**—Robert Halley, Chicago, Ill., assignor of one-fourth to the Plano Manufacturing Company, Chicago, Ill., a corporation of Illinois. A device having the combination with the stationary burner consisting of the shell adapted to be connected to the air-passage and having a circular recess therein, the burner-tube connected to the oil-supply, of a block having a passage therethrough and a circular portion fitting into the recess and adapted to rotate therein.

707,515. **PNEUMATIC HAMMER.**—Henry J. Kimman, Chicago, Ill., assignor to the Chicago Pneumatic Tool Company, Trenton, N. J., a corporation of New Jersey. A tool having the combination of a cylinder provided with a reciprocating piston-hammer, a handle-base provided with a



tubular projection extending into the rear end of the cylinder to close the same and provide an annular valve-chamber between it and the cylinder, and a tubular controlling-valve reciprocatingly mounted on such projection to govern the admission of motive fluid.

707,525. **PROCESS OF MANUFACTURING COKE.**—John W. Seaver, Cleveland, Ohio, assignor to the Wellman-Seaver-Morgan Engineering Company, Cleveland, Ohio, a corporation of Ohio. The process of manufacturing coke consisting in assembling the charge to be coked, bringing the charge to a charging position, removing the dome from the coking-hearth to a position over said charge, placing the charge in the dome, replacing the dome on the hearth, and coking the charge.

707,527. **SAND-BLAST APPARATUS.**—Ambrose G. Warren, Philadelphia, Pa., assignor of one-half to J. W. Paxson Company, Philadelphia, Pa., a corporation. A sand-blast apparatus, having a closed casing from which sand is discharged by the impact of fluid-pressure to a combining-tube, said casing having a substantially cone-shaped hopper-base, a central discharge-opening at the apex of the conical hopper, and flat basal portion contiguous to the opening, a valve-plate covering the opening, a valve-spindle passing through the casing, and means to rotate said spindle and operate the valve-plate.

GREAT BRITAIN.

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy:

Week ending July 31, 1902.

7,157 of 1901. Sulman & Picard, London.—The collection of slimes by means of centrifugal machines.

17,779 of 1901. C. F. Eckert, Saarbrücken, Germany.—In furnaces for reducing chrome iron ores, the use of a lining made of 40 per cent graphite, 40 per cent coke and 20 per cent clay.

18,429 of 1901. G. Grandal, Stockholm.—Agglomerating finely divided iron ores by means of water and pressure only.

4,566 of 1902. V. W. Mason, New York.—An improved form of crushing head for gyratory crushers, the wearing parts being easily renewable.

6,385 of 1902. F. C. Roberts, Philadelphia.—A roasting furnace easily fed from cars and feeding into cars, and with the least amount of gas conduits.

6,969 of 1902. O. Nicolai and F. Borner, Frankfurt-am-Main.—A solder for aluminum, composed of chloride of cadmium, calcium and zinc, with the metals tin, zinc, cadmium, aluminum and lead.

11,701 of 1902. D. L. & A. M. Brown, Birmingham.—Improved mine cars, with large wheels, without the body being elevated too high.

PERSONAL.

Mr. Fred Alsdorf, of Alma, Colo., has been making a business visit to Gilpin County, Colo.

Mr. Dennis Sullivan, of Denver, was a visitor to Gilpin County last week to look after his mining interests.

Mr. Chris Henne, mining engineer of Los Angeles, Cal., has been attending to professional business in Chicago for the last month.

Mr. G. M. Gouyard, mining engineer, of Denver, Colo., returned there a few days ago from a professional trip in Sonora, Mexico.

Messrs. Childs & Hansen, assayers of Los Angeles, Cal., are enlarging their laboratory and adding a complete outfit of Calkins machinery, new furnaces, etc.

Mr. Samuel Storrow, of Los Angeles, Cal., is on a two-months' trip in British Columbia looking after extensive mining properties with which he is connected as a mining engineer.

Mr. R. W. Brock, of the Geological Survey of Canada, is now engaged in examining the Deadwood and Copper camps, west of Greenwood, in the Boundary District of British Columbia.

Mr. R. B. Green, formerly chemist for the Minnesota Iron Company, at Two Harbors, is now stationed at Eveleth, Minn., as chief mining chemist for the United States Steel Corporation.

Mr. A. Nicholls, of Valley Falls, Kan., has been a visitor to the Independent mining district in Gilpin County, where he is interested in the operation of the Penobscot Mining and Milling Company.

Messrs. Wade & Wade, assayers, Los Angeles, Cal., have commenced the erection of a new building, 50 by 60 ft., on First Street, and will materially increase the capacity of their plant when the structure is completed.

Mr. Charles S. Corning, for some time manager of the smelter at Needles, San Bernardino County, Cal., has gone to Philadelphia to engage in other business. The Needles smelter has been closed down, dismantled and the machinery moved away.

Mr. Robert Bell, of Blackfoot, has been unanimously nominated by the Idaho State Republican Convention as candidate for the office of State Mine Inspector. Mr. Bell is a mining engineer who has had much experience in the practical operation of mines.

Mr. Leonard D. Sivy, mining engineer, of Spokane, Wash., has recently examined several mining properties in Washington for a syndicate of Harrisburg, Pa., people. He has also examined some properties in the East Kootenay District in British Columbia for London parties.

OBITUARY.

Felix Chappellet, one of the best known pioneer miners of California, died at his home in Oakland, Cal., on August 27. Mr. Chappellet was noted as a successful drift miner, and for many years operated on the Forest Hill Divide in Placer County, Cal., opening the successful Mayflower Mine among others. In the days of '49 he came to California, and was one of the first to try mining on the Klamath River, going from San Francisco by sea to that place and having, with his party, to fight the Indians. Mr. Chappellet was 74 years of age. His son, Felix Chappellet, Jr., is in charge of the Mohican Mine, in Tuolumne County, and is himself a skilled miner.

Thomas Burr Robbins, who died at his home in Medina, N. Y., August 25, was born at Camillus January, 1828, and when a young man went to Wisconsin and engaged in the lumbering business, getting large tracts of lumber land, which, eventually, became quite valuable. He came east at the beginning of the oil excitement, and was a prime mover in the vicinity of Oil City, Pennsylvania. After this oil boom died out, he went to Pittsburg, and interested himself in the coal business, and by careful management and business tact acquired large interests in the coal-fields. He was one of the chief promoters of the Pittsburg Coal Company, his son, Francis L. Robbins, of Pittsburg, now being president of the company. Through these many years of active business life he acquired much property.

INDUSTRIAL NOTES.

Three new Riedler pumps, electrically driven, each by a 225-h.p. motor (power generated on the Truckee River) have been installed at the Consolidated California & Virginia Mines on the Comstock Lode, Virginia City, Nev. Leon M. Hall is consulting engineer.

The Catoctin furnace property, located near Frederick, Md., has been ordered sold at mortgage sale on September 10. The sale of this furnace will end a legal battle which has been waged for the past three or four years during which period the furnace has been out of blast the greater portion of the time.

The new 3-high plate mill which the Lukens Iron and Steel Company is building at Coatesville, Pa., is expected to have the finest equipment of any yet erected in this country. The chilled rolls are 140 in. long and 38 in. diameter. There are 3 continuous heating furnaces completed, 9 ft. wide inside and 50 ft. long. The use of these furnaces will be an innovation in the practice of rolling steel plates. The mill will be in operations in October.

The Clot & Crist Machine Company, of San Francisco, has just furnished the Santa Fe Railroad for their Point Richmond shops, a water works pump which delivers water into a reservoir 1¼ miles distant and at an elevation of 176 ft. The pump is also used for pumping into the water mains for fire purposes. The company has also recently built a number of large oil pumps for the Southern Pacific Company to be used at oil pumping stations, and several large pumps for Mazatlan, Mexico, to be used for mining.

Thomas Potter, Sons & Co., of Philadelphia, manufacturers of oilcloth and linoleum, have adopted electric power distribution for the operation of their printing machines, the blowers used for drying oilcloth, elevators, and other general work throughout their plant. They have recently purchased from the Westinghouse Electric and Manufacturing Company 6 induction motors, which will be added to their present equipment of one 160-kw., and one 120-kw., two-phase, 220-volt alternators and 15 or 20 induction motors.

The Milner & Kettig Company, of Birmingham, Ala., owners of the patent and manufacturers of the Porcupine dry kilns, has closed a contract with the Kerber Lumber Company, of Beaumont, Texas, for dry kilns to the value of \$18,000. The same company is making dry kilns for concerns in Louisiana, Texas, Mississippi and Georgia to the amount of \$20,000 or more. The tubing used in the manufacture of these kilns is purchased in Pittsburg, Pa., and Helena, Ala., while the castings are purchased in the Birmingham District.

Announcement has been made of the purchase of the properties of the Williamson Iron Company, consisting of a 75-ton blast furnace and machine shops and foundry, by Frederick Dimmick, president of the Dimmick Pipe Company, at North Birmingham, Ala. The foundry and machine shops have been in steady operation for some time, and will continue so. The furnace needs some repairing. The furnace has been out of blast for a couple of years. It is not intended to connect the Dimmick Company with the recently purchased properties.

Considerable progress is being made in the erection of the new plant of the Pennsylvania Silica Brick and Manufacturing Company, at Latrobe, Pa. From present indications the plant will be placed in operation in October. When in full operation the plant will have a daily output of 20,000 high grade silica brick. The company owns and controls a vein of ganister rock 1½ miles long and from 60 to 100 ft. in thickness. William G. Humphrey, of Pittsburg, Pa., is president; George Alexander, Bridgeville, vice-president; Joseph E. McCabe, Carnegie, Pa., secretary and treasurer.

Mr. J. Howard Ewald, 83 Laclade Building, St. Louis, Mo., has been appointed sole agent for Southern Illinois, Missouri and Texas for the Scaife and We-Fu-Go water softening and purifying systems. These systems are manufactured only by Wm. B. Scaife & Sons Co., Pittsburg, Pa. Mr. Ewald has been for years identified with the iron and steel industries in this section, and is well known in manufacturing and engineering circles. He has made a special study of the subject of water purification, and is an expert on the subject of water and its purification.

The Krogh Manufacturing Company, of San Francisco, is building an 18-in. patent hydraulic dredging pump for the Hackett dredge, which will be used for deepening the bay channel and for filling work. They also manufacture these pumps for gold dredgers. The Hackett dredge has a capacity of 350 cu. yds. of solid material per hour, and is similar to one called the *Olympia* installed by this company for the West Coast Dredging Company, which has made the longest continuous run of any on this coast. The company is also making changes on the *Merritt*, another of the West Coast Company's dredgers, two 60-h.p. boilers and steel casings are to be added.

The Jefferson Iron Company, of Jefferson, Texas, was recently reorganized and the following directors elected: L. S. Colyar, R. W. Healy and George W. Lancaster, of Chattanooga, Tenn.; D. W. Meacham, of Cincinnati, O.; W. B. Ward, F. J. Rogers and W. T. Atkins, of Jefferson. L. S. Colyar is president and treasurer; W. B. Ward, vice-president, and W. T. Atkins, secretary. Mr. Colyar is president of the Rome Furnace Company, Rome, Ga., and of the Eagle Iron Company, operating a furnace at Attalla, Ala. It is expected that the furnace will blow in about December 1, running on low phosphorus charcoal iron. On the furnace property is an abundant supply of timber.

The last of the main generators and engines for the power plant of the Mersey Tunnel Railway, between Liverpool and Birkenhead, Eng., are about to be shipped from the Westinghouse Works at East Pittsburgh, Pa. These generators are of the railway type (1,200 kw., 650 volts, 90 revolutions per minute) and are to be direct connected to vertical cross-compound Westinghouse Corliss engines of 1,500-h.p. each. The power house lighting and the light of stations, sidings, etc., will be supplied from a separate generating plant comprising two compound-wound generators, each having a capacity of 200 kw., at 650 volts, direct connected to Westinghouse compound engines and running at a speed of 250 revolutions per minute. The power generating plant will have an aggregate output of about 6,600-h.p.—6,000-h.p. for the railway proper, and 600-h.p. for lighting. The Westinghouse electro-pneumatic system of train control is to be used, and the cars will be equipped with Westinghouse high-speed air-brakes.

Among other orders received by the Salt Lake branch of the Allis-Chalmers Company, they report the following principal sales during the month of August: Eleven Frue vanners, complete without belts, for the Trent Engineering and Machinery Company, of Salt Lake; 1 car-load of repair parts for Brown and Holthoff-Wethey roasters, for the Consolidated Mercur Gold Mines Company; one 22 and 44 by 48-in. cross-compound 1890 frame Reynolds-Corliss condensing engine, complete, together with 1 Reynolds patent jet condenser and air pump; two 200-h.p. water-tube boilers, Barnard-Wheeler cooling tower of 1,500 indicated horse-power capacity; necessary material for changing their present 22 and 34 by 48-in. non-condensing engine to run condensing. Above order received from the Bamberger-De La Mar Gold Mines Company, of De La Mar, Nev. One 125-h. p. boiler, internally fired, with Morison corrugated furnaces; 1 set each 26 and 36 by 15-in. Gates high grade rolls, with improved end adjustments; one 9 by 15-in. Blake crusher, for the Daly-Judge Mining Company, of Park City, Utah. Car-load of crusher repairs for No. 6 Gates style "D" crusher, for the American Smelting and Refining Company, of Murray. Car-load of repair parts for Gates crushers, also 8 Midvale steel roll shells for Gates high-grade rolls, for the Annie Laurie Mining Company, Kimberly, Utah. One 3-stamp prospecting mill, complete, for Levi Price, of Montana. Lot of screen sections and roll repairs for the May Day Mill. Car-load of malleable iron elevator buckets for the Montana Ore Purchasing Company, of Montana.

TRADE CATALOGUES.

The Metropolitan Injectors are made the subject of an illustrated catalogue, published by the Hayden & Derby Manufacturing Company, 85-89 Liberty street, New York City. These injectors are made in four different styles known as the Metropolitan automatic, the Metropolitan "1898," the Metropolitan double-tube, and the H-D injector. Each of these is illustrated by half 'ones and sectional drawings, with the prices of the different models of each style manufactured. The catalogue also describes the H-D noiseless water heater, strainers, check-valves, globe and angle valves, etc., manufactured by the company.

The American Steel and Wire Company issues a little 82-page pamphlet, 53 pages of which are given to descriptions of the company's "Crown" and "United States" rail bonds. The "Crown" bond has all parts made of drawn copper carefully annealed and of 98 per cent conductivity. It is claimed to combine the highest grade of material, superior workmanship and correct principles of construction and application. The "United States" rail bond is claimed to be the only one in which flat copper strips and welded terminals are used. It is so designed that it can be used inside the splice bar of a rail joint when the plate is only 1/4 in. from the web of the rail, and the leaves will fit readily into a space only 1-5 in. thick. The bond has a conductivity of 98 per cent.

The Richelieu & Ontario Navigation Company, of Montreal, Quebec, sends out a circular calling attention to the many delights of a trip down the St. Lawrence River in September. The weather then usually consists of beautiful sunny days, with cool, refreshing nights. Taking the company's steamers at Toronto, the trip embraces a sail through Lake Ontario, the picturesque Thousand Islands, the exciting descent of all the rapids to Montreal, thence to Quebec, Murray Bay and up the Saguenay River, the scenery of which is marvelous for wild grandeur and variety. Ample opportunity is afforded all along the route for exploring the many places with interesting historical associations, more especially Quebec, a city totally different from any other on this continent.

Kaltenbach & Gness, consulting and contracting engineers, of Cleveland, Ohio, have issued catalogue No. 5, descriptive of their K. G. concrete mixer. This mixer is of the cube type, and is adapted to the mixing of concrete, mortar, ore and other material without

the aid of any moving parts, such as paddles, shelves, discs, etc. The cube is built up of sheet metal securely riveted to angle irons. It is mounted through one diagonal on a hollow shaft, to which it is secured by heavy cast-iron trunnions. The shaft inside the cube is perforated for water emission. The driving mechanism for standard machines consists of a large worm gear mounted on the shaft at one end and driven by a worm. The worm and gear are mounted in a self-contained dust-proof self-oiling casing to secure alignment. Machines are also built to be driven with spur gears and pinions. The firm also makes hoppers and watering tanks to go with the mixer. The catalogue furnishes a partial list of engineering works in which these mixers have been used. Among them are the Chicago drainage canal and the Buffalo, Cleveland and Lorain breakwaters.

GENERAL MINING NEWS.

(From Our Special Correspondent.)

Valley Iron Company.—The stockholders of this company, which proposes to operate iron and coal mines in Alabama, Georgia and Tennessee, and to erect a large modern blast iron furnace on the Queen & Crescent Railroad, between Birmingham and Chattanooga, held a meeting in Birmingham, Ala., August 28 and elected directors and officers. The details for the furnace and other improvements to be made on the property acquired are now being worked on. The following directors of the company were chosen: Archer Brown, of New York, chairman of the Empire Steel and Iron Company; H. A. Marting, of Ironton, O., of the Marting Steel and Iron Company; J. G. Battelle, of Columbus, O., vice president of the Columbus Iron and Steel Company; J. A. Andrews, of Newport, Ky., president of the Newport Rolling Mill Company; James Bowron, former treasurer of the Tennessee Coal, Iron and Railroad Company; G. B. McCormick, vice-president of the Woodward Iron Company, Birmingham; James L. Gaines, Nashville, Tenn., former assistant general manager of the Tennessee Coal, Iron and Railroad Company; Erskine Ramsay, Birmingham, Ala., proprietor of the Bank of Ensley; Charles A. Stillman, Birmingham, Ala., resident manager of the firm of Rogers, Brown & Co. The following officers were selected: President, J. G. Battelle; vice-president, Erskine Ramsay; secretary-treasurer, J. F. Steins, of Wheeling, W. Va.; chairman of the Executive Committee, James Bowron, of Birmingham; general superintendent, Charles A. Bowron. The properties of the company have been inspected and the work of building the furnace, opening coal mines and building coke ovens will be started at once. The company expects to be manufacturing iron by January, 1904.

ALASKA.

JUNEAU DISTRICT.

Rodman Bay Mining Company.—It is stated that this company is negotiating for a 60-stamp mill to be built by the Allis-Chalmers Company.

ARIZONA.

MOHAVE COUNTY.

(From Our Special Correspondent.)

Cyclovic.—A. B. Robbins is to have his new crushing and cyaniding plant in operation on ores from this mine in Gold Basin next week. In addition to the new ore on the dump and coming out, the old dump is to be treated and the gold saved by the new process of reduction.

El Dorado.—Charles Gracey will return from San Francisco September 1 and resume operations on this gold mine in El Dorado Canyon, according to a letter received by J. P. Finegan, of Chloride, this week.

Great West.—This mine, in Weaver Gold District, has a 2-stamp mill in operation on its free milling ore. As a result of a week's run an \$800 gold retort was shipped to San Francisco the past week.

Hackberry.—This mine, in the eastern part of the county, will be reopened and worked by sinking a shaft ahead of the old 800-ft. incline. George Howell, of Australia, is the new superintendent.

Lucky Boy.—Fred. Stull, superintendent of this mine on Cerbat Mountain, reports good ore in the breast of the 300-ft. drift on the 500-ft. level. Twelve men are at work.

Payroll.—Judge J. M. Murphy recently paid this mine at Chloride a visit looking to a resumption of work. The mine has a big body of low-grade milling ore.

Portales Del Oro.—This newly organized company at Union Pass will soon make regular shipments of gold ores.

Redemption.—This mine, near the Tennessee at Chloride, belonging to Robert J. Ferguson & Sons, of Kingman, is being worked again and the low-grade copper and silver ores treated at the Vulcan Smelter.

Val Verde.—L. A. Snyder, of this copper mine in Yavapai County, was in the county the past week

and, it is understood, secured options on the Keystone and Queen Bee mines of James Uncapher, of Mineral Park.

Vulcan Smelter.—This new plant, at Chloride, is treating ores very successfully and has enough on hand and coming in to keep going for a long time. It pays 95 per cent silver values, \$19.50 for gold, and deducts 33 1-3 per cent from copper less freight and 3c. refining charges under quotations of the ENGINEERING AND MINING JOURNAL for electrolytic cathodes on day of settlement.

YAVAPAI COUNTY.

Century.—On this mine, owned by Judge Sanford, of Prescott, the hoist is now in place and at work. The shaft is down 120 ft., and is to be sunk to 300 ft. before drifting is begun.

Williams.—This group of claims, 9 miles south of Prescott, has been bonded to J. A. Connon, of Los Angeles, Cal. About 700 ft. of development work has been done on the group, and a vein 4 ft. wide is reported.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

Argonaut.—Work in this mine at Jackson has been suspended. At the 1,350 level it will drain into the Kennedy Mine, with which it has long been in litigation.

Defender.—The hoisting works and boarding-house of this mine, at Defender, have been destroyed by fire. The mill was also burned.

Fremont Mining Company.—In this mine, at Amador City, C. E. Purrington superintendent, the ledge has been encountered in the 850-ft. level of the Fremont shaft, and the rock is as good as on the level above.

Ione Gold Mining and Milling Company.—Development work is being pushed on this property at Ione. Mr. Davis, local superintendent, and G. E. Edgar, of Seattle, Wash., manager.

Kennedy Mining and Milling Company.—Exploration work in this mine, at Jackson, Mr. J. F. Parks superintendent, is in progress on the 2,400 and 2,500 levels from the new East shaft.

Oncida Gold Mining and Milling Company.—Superintendent Hampton has an electrically operated pump at work on the 1,300 level in this mine at Jackson. There are 6 double-acting plungers. A tank has been put in the rock at the station 80 ft. long, 22 ft. wide and about 8 ft. deep. The shaft is to be deepened. Forty stamps of the mill are running.

Reeves.—At the D. D. Reeves Mine, near Plymouth, a mill will be erected.

Rhetta Consolidated Gold Mining Company.—In this mine, at Plymouth, W. W. Worthing president, they have found a vein of pay ore in the north drift, 700-ft. level, Kretcher vein. This is an entirely new find.

South Eureka.—In this mine, at Sutter Creek, J. F. Parks, of Jackson, superintendent, the main shaft is now 250 ft. below the 2,000 level. The ore being milled is from the 2,000 level.

BUTTE COUNTY.

(From Our Special Correspondent.)

Mineral Product.—According to figures of the State Mineralogist the increase in mineral product for 1901 in this county was over the previous year \$378,981. The increase is entirely due to the output of the dredgers around Oroville, the center of dredge mining in California. The total gold output of the county for the year was \$864,978.

Butte Queen.—An air shaft is being sunk on this mine at Inskip, and when completed the force is to be increased.

Dredges.—Two more new dredges are being built for the Feather River Exploration Company at Oroville, J. J. Hanlyn superintendent. The company already owns three dredges, which are at work.

Golden Summit.—This mine, at Inskip, is being reopened by Reece & Weaver.

Lynch & Slow.—At this mine, at Kimshe, 30 miles from Oroville, the 265-ft. tunnel is being driven ahead to strike the shaft.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

Miners' Union.—A miners' union, called the Calaveras Union, has been organized at San Andreas.

Altaville.—Work has been resumed at this mine near Angels. They are cross-cutting and drifting on the 400 level.

Bedrock Gold Mining Company.—This company, Geo. Berg manager, is operating a dredge on the Calaveras River, south of Valley Spring.

Benson.—At this mine, formerly the Parnell, at San Andreas, cross-cutting is being done.

Golden Eagle.—At this mine, near Jenny Lind,

Geo. B. Tolman superintendent, grading is now completed for the new plant, and all is ready for the engine, pump and hoist.

Last Chance.—At this mine the compressor to run three drills is nearly ready for work. A new galvanized frame is being erected.

Whittle.—This mine, owned by the Baltimore Mining Company, near Angels, E. K. Stevenot superintendent, is to have a new hoist.

FRESNO COUNTY.

(From Our Special Correspondent.)

Dizie Queen.—This mine, near Dunlap, owned by Duke Whitt, of Visalia, Tulare County, has been bonded to John McKiernan, of San Francisco, for 2 years, and that gentleman is about to put up a 3-stamp mill. The ledge is quite a large one, carrying good ore.

HUMBOLDT COUNTY.

(From Our Special Correspondent.)

Ruby Group.—At Eureka eleven 20-acre placer locations on the Klamath River and at Bluff Creek have been recorded by C. C. and Mary A. Russ, Geo. and Mrs. St. John, C. E. and Effie B. Harmon, K. A. Elmer, Charles Fehely, A. C. Merrill and Geo. N. Bailey. The water of Bluff Creek has been taken up for use of the group of claims.

Suregoin, Watch and Klamath River Claims.—These claims are included in 230 acres of placer locations near Mettah, made by E. R. Thompson, M. T. and W. E. Powell, W. N. and C. A. Speegle, M. J. Allen and Lucy and Bertha Thompson.

INYO COUNTY.

(From Our Special Correspondent.)

Golden Argus Mining Company.—This company is erecting a 5-stamp mill on its property in the Argus Range.

Lcidy-Vanfleet.—At these mines, W. C. Pidge manager, 14 men are now at work. A Merrill mill and concentrators are to be put in. These mines are near Bishop and are under bond to Mr. Pidge, who also has the Yancy Enloe mines under bond.

Molybdenum.—O. H. Hill and M. C. Hall, of Bishop, have a deposit of molybdenum near the Hillside dam, south of Bishop Lake. The deposit is said to be quite large, but is unworked.

Ratcliff Consolidated Gold Mining Company.—This company, at Ballarat, W. W. Godsmark manager, has leased the water plant of the South Park Mining Company, including the gasoline engine, pump, etc., and will pump water to the Ratcliff Mine.

LOS ANGELES COUNTY.

(From Our Special Correspondent.)

Iron Ore Smelter.—Near Newhall an experimental furnace to smelt iron ore with oil fuel has been constructed. The ore is mined a short distance from the smelter. The result of the practical test now being made will determine the future plans of the company.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

Bondurant.—This mine, at Coulterville, owned by the Boston & Mariposa Mining Company, Fred Whitman superintendent, is to resume operations shortly, it is stated.

Early.—This mine, at Jerseydale, owned by Reville Brothers, and under the superintendence of A. T. Mitchell, has been started up again.

Hite.—At this mine, at Hite, H. J. Sisty superintendent, the men are repairing the dam and flume preparatory to reopening the property.

McAlpine.—The shaft at this mine at Coulterville is down 70 ft., and a steam hoist is to be installed when it reaches 200 ft.

Pinon Blanco.—This property, at Coulterville, is one of the "Ward Mines," owned by A. H. Ward, of 71 Stevenson street, San Francisco. It is reported that the mine is to be started up again and 2 tunnels run.

MONO COUNTY.

(From Our Special Correspondent.)

Golden Gate.—Work is progressing on this mine at Antelope Valley (Bodie P. O.), and the ledge has widened, showing some free gold.

Tioga.—Bliss & McDuffy, of Massachusetts, owners in this mine, have been visiting it at Lundy, and are considering the desirability of running one of the tunnels in the Shepherd claim 1,000 ft. further.

NEVADA COUNTY.

Pennsylvania Consolidated Gold Mining Company.—In our issue of August 9, under this head appeared a note of the decision of the court in this company's suit against the Grass Valley Consolidated Mining Company. While the decision was correctly stated, the defendant in the case was the Grass Valley Exploration Company, and not the Grass Valley Consolidated Company, with which the Pennsylvania Consolidated Company has had no litigation. The

mistake occurred through a confusion of two similar names, and we wish to correct the record.

(From Our Special Correspondent.)

Canada Hill and Slate Ledge.—These two mines have been bonded to York, Pa., men through Geo. W. Root, president of the Grass Valley Consolidated Mining Company. The Canada Hill (or Charronat) Mine is near Nevada City, and the Slate Ledge (or Perrin) Mine is at Grass Valley. The Canada Hill was formerly a large producer, but has been shut down some time. The mine is to be pumped out at once and a complete plant put in if indications warrant. The Slate Ledge was also a producer, but the present machinery, mill, etc., is not up to standard of modern requirements.

Conlon.—The mill at this mine, near Grass Valley, recently destroyed by fire, is to be rebuilt as soon as possible.

PLACER COUNTY.

(From Our Special Correspondent.)

John Beach, of Auburn, has discovered on the American River, above the North Fork bridge, an exceptionally rich vein, the best ore from which he is panning out in a hand mortar and shipping the rest to the Selby Smelting Company, packing it to Auburn on mules. Some of the surface specimen rock is worth about \$14 per pound. Beach is a very persevering prospector, and has been prospecting in that vicinity for the past two years. He panned all the way from the river to the top of the mountain in a very rough country, carrying each pan of dirt back to the river to wash. The new find is repaying him for all his work.

Crater.—This old mine at Ophir has been bonded by P. S. Lozano, and it is expected work will soon commence upon it.

Golden West Consolidated Mining Company.—The Big Hill Mine at Canada Hill, owned by this company, is being worked by a force of men, who are running a tunnel to drain the channel. They have 1,100 ft. of tunnel still to complete to reach the gravel channel. Mr. Fred Schultze is president of the company, as well as superintendent of the Big Dipper drift mine at Iowa Hill.

Haub.—This drift gravel mine at Shady Run has been sold to Tacoma, Wash., men, with C. T. Crozier as manager and Robert Watson as the superintendent. Mr. Watson has operated the mine many years.

Jupiter.—This mine at Forest Hill has closed, and the property is being worked by leasers.

Monumental.—In this mine, at Ophir, Messrs. Johr and Andrew Johnson have struck rock which prospects well.

Peckham Hill.—This mine at Forest Hill, owned by A. C. Burrage, with Geo. McAuley as superintendent, has installed a new compressor, for use in driving the new tunnel.

Three Stars.—A new triple-compound pump has been put in this mine at Ophir.

SACRAMENTO COUNTY.

(From Our Special Correspondent.)

Pacific Gold Dredging Company.—This company has finished its new dredge at Mississippi Bar, near Folsom. This is the fourth river dredge in that section.

SAN DIEGO COUNTY.

(From Our Special Correspondent.)

Tourmaline.—The San Diego Tourmaline Company, which recently bought the Gail Lewis Mine at Mesa Grande, is installing a polishing plant at San Diego.

Witch Creek Mining and Irrigation Company.—This company, at Witch Creek, is running a tunnel, now nearly completed. They intend working bodies of gold-bearing gravel said to be quite extensive.

SANTA BARBARA COUNTY.

(From Our Special Correspondent.)

Gypsum.—A Santa Barbara company is about to commence mining a gypsum deposit located at Cuyama.

Summerland Oil District.—The consolidation of the oil interests at Summerland, just completed, will do away with scores of separate pumping plants, and one large plant capable of operating all the wells will be constructed. The pipe-lines will also be led to a single reservoir. S. W. Knapp, of Santa Barbara, arranged the deal, which will do away with competition in that field. Most of the oil wells at this place are under the ocean, and long wharves have been built far seaward, beyond the surf line, on which the rigs are placed and worked.

SHASTA COUNTY.

(From Our Special Correspondent.)

Balaklala.—The diamond drills and other prospecting apparatus used by the Kimberley Syndicate at this mine near Kennet have been shipped away to Nevada, and development work has been suspended. The Kimberley people had a bond on the property, but have evidently given it up.

Oro Fino.—This mine, at Shasta, recently sold to a company represented by Wm. Moran, is expected to change hands again shortly. Fifteen men are at work on the property, and ore is being hauled to the smelters at Keswick.

Sybil.—A steam hoist, air compressor and drills are to be added at this mine, French Gulch, G. A. Von Kruze manager.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

Cherry Hill Mining Company.—The mines of this company near Yreka have not been shut down as reported, but 40 men are being kept at work.

Helena Gold Mining Company.—This property at Callahans, James McKeen superintendent, is owned mainly by A. D. Chidsey, of Easton, Pa., who is president of the company. The ore is first crushed in a rock breaker and then passes through a Kent mill. From this mill the ore goes direct to the cyanide plant, which has a capacity of 60 tons daily. Mr. McKeen states that he is saving a very high percentage. At the property there are 12 miles of water ditches and pipe and a Pelton wheel furnishes the power.

TEHAMA COUNTY.

(From Our Special Correspondent.)

Sulphur Deposit.—W. M. Smith, J. K. Taylor, Henry Gray, J. A. Haselwood, J. M. Kinser, J. D. Kennedy and J. A. Healey, of Red Bluff, have located 160 acres of placer mining ground in sections 16, 21, 23, T. 30, R. 4 E., to be known as the Gray & Taylor sulphur and placer mine.

TRINITY COUNTY.

(From Our Special Correspondent.)

The Cleary, Payne & Keenan Company have recently built a gold dredger on Trinity River, near Trinity Center.

Fairview.—A new centrifugal pump for this mine at Minersville, Jos. Porter superintendent, has been shipped. The machinery for the new 10-stamp mill has been hauled to the mine from Redding.

Langdon Flats.—These flats on Trinity River, near Minersville, are being tested with a Keystone drill for gold-dredging operations.

Union Consolidated.—At the Dorleska Mine, owned by this company, H. Z. Osborne, manager, and Matthew McIlwaine, superintendent, the mills are running full time. A new boiler has been provided. Carter & Mortimer have completed 800 ft. of their 1,000-ft. contract on the third level.

Yellow Rose of Texas.—This mine, at Abrams, owned by Geo. L. Carr, of Abrams, and the Misses Rider, of Napa, is running full handed. A long tunnel to tap the ledge at depth is contemplated this season.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

Cosmopolite.—At this mine, near Groveland, Harry Argall superintendent, the shaft is now down 125 ft., and a station is being put in.

Dutch.—At this mine, at Quartz, oil is being used for fuel under the boilers, and 3 1,500-gal. tanks have been placed in position. The 20-stamp mill is running day and night.

Garfield.—At this mine, at Carters, owned by Sharwood, Floyd & McTarnahan, the tunnel is in 100 ft., and a cross-cut is being driven.

Grizzly.—Sinking continues at this mine at Carters, W. R. Hall manager. The mill will be running shortly.

Harvard Mining Company.—The mill at this mine, at Jamestown, B. M. Newcomb, of Oat Hill, Napa County, manager, will soon be started, and more active work carried on.

Hidden Treasure.—At this mine, near Carters, a tunnel is being run to tap the gravel bed.

Hunter.—This mine, at Carters, owned by J. P. Sweeney, of San Francisco, is to be started shortly under superintendence of C. A. Holland.

Lady Washington.—At this mine, at Carters, owned by W. H. Martin, of San Francisco, an air compressor is to be installed and a pipe-line to furnish water.

Mayflower.—This group, near Groveland, has been sold to W. J. Graham.

Mount Jefferson.—A cyanide plant is being put in at this mine near Groveland, J. M. Meigham superintendent.

YUBA COUNTY.

(From Our Special Correspondent.)

A new gold mining dredge has commenced work on the Bear River, 4 miles above Wheatland.

W. P. Hammon, of Oroville, is prospecting the

Yuba River, 10 miles above Marysville, for dredging work. Drills are being used to test the gravel.

COLORADO.

GILPIN COUNTY.

(From Our Special Correspondent.)

Mining Deeds and Transfers.—M. Fleiss et al to C. W. Baldwin, the Black Bear, Prince Henry and Klence Fall lodes, Enterprise District; Robert Cooper et al to the Williams Mining Company, the Williams lode, Lake District; John Guldberg to E. J. Adams et al., the Iowa, Nevada and California lodes, Wisconsin District; City of Black Hawk to James Flynn, tracts A, B, C, D and E, and the Flynn tract, Enterprise District; A. Platt to P. Rohling, 1-12 interest Happy Five, Happy Group and Little Maid lodes, Pine District; A. Rogers et al to Fred. Neumeier, the Independence lode, Independent District; W. M. Phillips to J. A. Hoyt et al, $\frac{1}{2}$ interest in Dig More, Maine, Oregon and Texas lodes and Graham Tunnel site, Vermilion District; H. S. Bodkins to the Missouri and Colorado Milling and Mining Company, interests in Old Ann group of 8 lodes, Hawkeye District; Fred Frickie et al to J. W. Thomas, the Gilpin County lodes Nos. 1, 2 and 3 lodes, Central District; C. Lerchen to R. C. Miller, the Conjunction lode, Russell District.

Elk Park Mill.—Eastern parties, who are becoming interested through Cripple Creekers, are overhauling the Elk Park Mill in the Pine District, and expect to keep it running on concentrating ores from the Annie H. property and properties on Montana Hill. The properties were formerly owned and operated by the Elk Park Gold Mining and Milling Company, with stockholders mainly in Pennsylvania.

Mackey-Burroughs.—A local pool, which is operating this property under a lease, has stopped shipping to the mills and is sending the product to the Golden Smelter. The ores are averaging over \$100 per cord, or about \$12 per ton; better returns than by mill treatment. G. M. Laird, Central City, Colo., is manager.

Old Town Mining and Milling Company.—An order has been placed for a 4-drill Leyner air compressor, and as soon as it is installed the shaft, now 600 ft., is to be sunk to a greater depth. The average production is between 40 and 50 tons, all of which goes to the Jackson Mill at Idaho Springs, and the monthly production is given as \$15,000, leaving a handsome profit to the owners. The working force shows a total of 50 men, with G. K. Kimball, Jr., Idaho Springs, as manager.

Straub.—W. Ballantyne, of Central City, will put up a small plant of machinery on this property on Gunnell Hill, for the purpose of cleaning out and examining the workings in the interests of Easterners.

Sylvania Gold Mining and Milling Company.—A lease and bond has been taken on the Mona lode, situated on Belleview Mountain, adjoining the well-known Specie Payment, Champion and other mines. The shaft is only 100 ft. deep and a plant of machinery will be installed and sinking operations will be commenced. L. A. Rice, Russell Gulch, Colo., will be in charge.

Waltham Mining Company.—An order has been placed for a 34-h.p. gasoline hoisting plant from Fairbanks, Morse & Co., for the Waltham Mine in Russell District, and a contract is to be let for a new shaft building, 25 by 55 ft. The property is shipping about 25 tons daily to the Carpenter Smelter, the ores averaging from \$10 to \$20 per ton, while the last shipment of iron ores went \$57 per ton. The shaft is only 100 ft. deep. Local parties are interested, with R. H. Hastie, Nevadaville, Colo., as manager.

Wilkes-Barre Gold Mining Company.—Operations have been suspended temporarily at the Katie and Francis group in Eureka District, as the Pennsylvanians have been unable to secure a clear title to the property owing to the present litigation, including the Spur Daisy property.

LAKE COUNTY—LEADVILLE.

(From Our Special Correspondent.)

The tonnage figures now being computed for last month's shipments will show slight falling off from the month previous. The iron market is dull, while shipments have been curtailed on a number of the low-grade sulphide producers. A heavy producer counted upon was the Greenback, but Manager Mulrooney and the smelters have not yet reached an agreement and he has closed down.

Bartlett.—Very little ore is being taken out, as the operators (lessees) are running a 1,200-ft. tunnel. This will save expense of pumping water, which has consumed all the money made from ore shipped, and it will also cut the several veins of the hill.

Boulder Mining Company.—This is a new company, headed by Timothy Kyle, operating the White Cloud group, Big Evans Gulch, which properties have lain idle for years. The new shaft being sent down with

3 shifts is 4 $\frac{1}{2}$ by 13 ft., and will be equipped with a large plant of modern machinery. This north slope of Breece Hill has never been successfully developed on account of water difficulty, but the new company is all prepared for this contingency.

Continental Chief Mine.—This property, long idle, is resuming. The old workings are being cleaned out and repaired and the property will then be extensively developed under the direction of Manager Tona Michaels. A large and rich lead ore shoot exists in this ground, and has already produced a small fortune in past operations.

Golden Era Group.—This is located on Loveland Mountain and has 55 acres. C. I. Rader, a big steel man of Pennsylvania, is president of the company. Other interested parties in the new company, known as the MacLean Mining Company, are Utah capitalists, and Dr. MacLean, of Leadville.

Helen Gould.—The copper vein is holding out and growing richer. New work in another part of the property has also been commenced. Some ore will be shipped shortly.

Home Extension Company.—President Dunbar is here effecting a settlement of the financial difficulties. An extension from the city for mineral rights has been granted on the basis that the company settle up within 60 days its indebtedness here.

Leadville District Railway and Power Company.—This new incorporation, filed under the laws of New Jersey, has just requested franchises here to build an immense electrical plant to supply power to the mines and smelters and also to construct a railway to the mines of the district. T. W. Kloman, of New York, is here, representing the New York parties interested in the new company, and if franchises can be secured work will commence at once on a 5,000-h. p. plant, erected at Arkansas Junction, 3 miles to the northwest of the city limits. The introduction of electricity will greatly cheapen mining here, due to the heavy expenses now needed for pumping.

Louisville.—The new owners, Reynolds & Hannifen, are developing on the ore bodies and conducting much new work. The property will be worked on a more extensive scale than for 10 years past. A feature will be the handling of the low-grade zinciferous deposits.

Mineral Mountain.—Eight claims on this mountain, Twin Lakes Section, owned by Anton Simon and John Lane, have just been sold to Iowa people, headed by Messrs. De Ford. The purchase price is \$8,000. A good vein of ore is exposed and the new company, having plenty of capital, will develop on a large scale.

New Leadville Home Mining Company.—The directors monthly meeting shows a steady production of 150 tons per day and development being pushed on the Penrose iron bodies.

President.—Operations are to be resumed by the owners, who are headed by Henry Gaw. Large bodies of low-grade siliceous ore have been opened up and shipments begin at once.

PARK COUNTY.

(From Our Special Correspondent.)

London.—More work is being done on this property than any in this section of the country. There are at present about 16 men employed in extracting ore from the stopes in the main or Vienna Tunnel, and steady shipments are being made. The mine has been working steadily all winter, but suspended shipments for awhile in the spring, during the breaking up of the snow road. On the south side of the mountain contractors are at work on the long tunnel, which is destined to cut the vein considerable deeper than the main tunnel. Messrs. Shuck, Carmichael and Johnson have this contract. The plant of machinery is to be installed shortly. Higher up on the mountain another tunnel has been commenced and will be pushed as rapidly as possible to furnish air for the main workings. This property has been shipping more or less steadily for a long time, and is considered one of the stable mines of the district. Mr. John Kuhn has charge.

Placer Mining.—The increase of activity in this class of mining was noticeable in the early part of the season, and had it not been for the fact that very little snow fell in this section of the country during the winter and practically no rain during the summer the placer season would have been a good one. At present, however, all the mines have shut down, with the exception of the Snow Storm, situated between Alma and Fairplay, near Cottage Grove. The other placers that were worked during the early part of the season were as follows: The Alma Placer, situated at Alma; the Rhodes Placer, on Beaver Creek, and the Cincinnati Company's placer, at Fairplay. The connection has just been made between the Alma Placer ditches and the Snow Storm ditch, and since the shutting down of the Alma Placer the water is being used by the Snow Storm people. This placer is reported to be very rich, but until this season has not been worked for many years. The property is owned

by the Gold Pan Company, which is also doing considerable work in Summit County.

Russia.—Work has recently been commenced on this old property, situated on Mount Lincoln. Several men are at present at work in erecting a new cabin and getting ready to start a new tunnel. No work has been done on the property for a number of years, and the old buildings have gone to ruin. The new tunnel is aimed to prospect the contact between lime and quartzite. A large amount of silver ore was shipped from this property in an early day and was found in lime near the porphyry contact. The property is situated at a height of nearly 14,000 ft. above the level of the sea and is owned by Mr. A. L. Pogue. Mr. G. W. Brunk, of Alma, has charge of the work. It is the intention of the owners to give a contract for the tunnel as soon as it can be put in shape to work.

SAN JUAN COUNTY.

(From Our Special Correspondent.)

Lonne & Johnson are erecting a 5-stamp mill near Chattanooga for experimental purposes.

Bessie.—A car-load of rich ore has been taken out while cutting a chamber from which to sink a 75-ft. winze on the vein.

Esmeralda.—The output has been increased to 40 tons daily of crude ore.

Georgia Group.—W. J. Parker is running an 80-ft. cross-cut to cut the vein, which shows tellurium on the surface.

Good Hope.—An experimental 10-ton chemical mill was recently put in operation with such satisfactory results that a large plant will be erected at once upon similar lines.

Green Mountain Mining Company.—An investigation of the ore bodies is being made by Eastern experts relative to the advisability of driving a 3,000-ft. tunnel to cut the veins at great depth.

Hattie Group.—John M. Dodd has opened up 18 in. of good lead-silver ore, and will begin shipping at once.

Hidden Treasure.—Allen & Rowe put a force of men to work recently on this property on Sultan Mountain. A lead of good lead-silver ore is being developed.

Idaho.—The new tunnel is in 1,800 ft., and a 400-ft. upraise is being driven to connect with the upper workings. The tunnel is in good ore. A mill is contemplated next season.

Indiana.—A shipment of 6 car-loads of ore was recently made from the Indiana, in Grey Copper Gulch, to the local smelter.

International Reduction Company.—A new and larger mill is to be erected by this company in the Bear Creek District for the Sylvanite Company.

Little Maud.—Henry Born is preparing for shipment a lot of high-grade ore, mined from the streak being followed while driving for the rich shoot about 40 ft. ahead.

Little Swiss.—This group is located in Arrastra Basin, and is being worked by M. Grunow, the owner. Nearly 1,000 ft. of development has been done. Recently a 6-ft. vein of good milling ore was encountered.

Mammoth Tunnel and Mining Company.—A vein 4 ft. wide of fine galena ore has been opened in a 12-ft. drift run from the bottom of the 125-ft. shaft. The vein is supposed to be a continuation of the Crown Point lead.

Mazeppa.—D. Heindel has struck a good vein of ore in this property on South Mineral Creek, consisting of a 4-ft. vein carrying gold, silver and lead.

Sioux Mining Company.—Bids will shortly be let for driving the main tunnel 300 ft. further.

Skookon Group.—A. E. Copp, of Boston, has secured an option on these claims, above Eureka, which are being worked by F. S. McGuire, the present owner.

Star of the West.—A force of men has been put at work, and the 300-ft. tunnel is being rapidly advanced. About 50 ft. of timbering is also being done.

SAN MIGUEL COUNTY.

(From Our Special Correspondent.)

Mayflower.—This group of claims, located in Grey's Basin, an arm of Bridal Veil Basin, 5 miles southeast of Telluride, was sold to John Ekman, a well-known mining man of Calumet, Mich., this week, the consideration being in the neighborhood of \$100,000. The group consists of 3 claims and a mill site. All the claims are patented, and there has been about 500 ft. of development performed on them, showing good veins running from 5 to 7 ft. in width. A stock company will be organized to operate the group, and it is possible that a tunnel over $\frac{1}{2}$ mile in length will be driven to cut the veins at a depth of 1,600 ft. below the surface. The principal value is gold, and the ore is free milling. It will run \$20 per ton in gold. John Ekman, Calumet, Mich., will be general manager.

Mount Wilson Gold and Silver Mining Company.—This company, which operates the Silver Pick group;

located on Mount Wilson, 18 miles southwest of Telluride, has mortgaged the property, consisting of 9 lode and 2 placer claims, for \$100,000, and active operations will be inaugurated on the property in the near future. The mine has been idle for some time, but when running was one of the best known producers in the State. It has the reputation of carrying the largest continuous pay streak of any mine in the county and has produced over \$2,000,000.

TELLER COUNTY—CRIPPLE CREEK.

(From Our Special Correspondent.)

Doctor-Jack Pot.—The Orwig and Ames lease on the old Davenport workings of the Jack Pot claim of this company are shipping a fair amount of ore and the lease is looking well. Several other leases on this property are also shipping ore. No work is being done on the property on company account. The old Davenport lease on this property formerly shipped a very large amount of ore and was considered one of the bonanza leases of the district. It was this vein that caused so much litigation between the Doctor and the Jack Pot companies and the Doctor and the Nugget companies which ended in the consolidation of interests and the formation of the Doctor-Jack Pot company.

East End Gold Hill.—Quite a little activity is noticeable on the southeast end of Gold Hill at present. The Hummer lease on the Gold Bond property is shipping quite a little ore and a new strike has been reported recently on the Cardinal, which adjoins the Gold Bond property. About two years ago this part of Gold Hill was the scene of considerable activity. The Caledonia has done considerable work and a number of other properties were worked through the Ophelia tunnel.

Elkton Consolidated Mining Company.—The pumping on this property is being gradually stopped and the workings confined to the upper levels. The 8th level is bulkheaded. It is also understood that a number of changes have been made in the handling of the property, which will work to its best interest. The Elkton Company owns a large interest on Raven Hill, but the company has had to handle a great amount of water during the past year.

Gold King Mining Company.—From all reports this property is showing up better than for some time past. While the property has been a continuous shipper for the past 10 years, it is now reported to be in very good shape. It is owned by Colorado Springs people and not much is given out about the condition of the property. This property was the first one to discover pay ore in the Cripple Creek District. Mr. Wm. Lennox, of Colorado Springs, is general manager of the mine.

Golden Cycle.—It is understood that the deal for the control of the stock of this company by Col. Lillibridge and associates has been declared off. It is understood that Col. Lillibridge is acting for himself and Messrs. Penrose and MacNeill. It is stated that the option includes 800,000 shares of the stock and that the price was \$700,000. It is stated that a thorough examination of the property has been made for these gentlemen, and while the mine was found to be in excellent condition it is thought that the price asked was too great and the deal is, therefore, off. The mine is said to be producing at present about 140 tons per day, from the 7th, 8th and 9th levels, and is part milling and part smelting ore.

Granite.—As far as can be learned the condition of this property on Battle Mountain is very satisfactory. Considerable good ore has been opened up in the mine of late, especially on the lower levels. It is understood that the property is shipping about 50 tons per day of about \$30 ore. The property is owned by Messrs. Tutt, Penrose & MacNeill, who some time ago purchased it from the Moffat and Smith people, of Denver.

Isabella Gold Mining Company.—Considerable excitement has been noticeable the past week with regard to Isabella, and a strike of large proportions has been reported; however, no very wonderful strike has been made, but a good body of ore has been opened up on the 11th level. While it is not known how long this ore will last, at present it is showing up very well. A number of lessees are also doing well on the property, and as far as can be learned the outlook for the Isabella is better now than it has been for some time past.

Joe Dandy.—A deed was recorded this week transferring the Joe Dandy claim and other property from Messrs. Rice and Coe to the Joe Dandy Gold Mining Company. It is understood that this does not change the ownership of the property, but has been done for the sake of incorporation. The Joe Dandy property is situated on Raven Hill, not far from the old Moose ground, and has shipped considerable ore in the past.

Pharmacist Consolidated Gold Mining Company.—A very good ore shoot has been opened up on the north block of the Pharmacist claim of this company, which is under lease to the well known leasing firm of McFarland & Ownbey. This shoot was found in an old stope which has not been worked for some

months. Several cars of ore have been shipped, and at present it is looking very well indeed. Some ore is also being shipped from the winze below the 6th level of the Wrockloff shaft. The annual meeting of the Pharmacist Company occurs in a few days, but as far as can be learned the directors of the company will be the same as for the past year.

Pinnacle Gold Mining Company.—It is reported that the ore shoot on this property has been recovered in the lower level. Some time ago a large amount of ore was shipped from the Lansing claim by Messrs. Whipp and Glenn, who worked it under lease for some time. Some months ago a new leasing company took hold of the property, and it is understood they have opened up some good ore. This property lies on the north slope of Bull Hill.

Reported Consolidation.—The report that the Pharmacist Company, the Acacia Gold Mining Company, the Free Coinage Gold Mining Company, and the Empire State Consolidated Gold Mining Company were to be consolidated into one company, has been denied. For several days a report to the effect that these Bull Hill properties were to be consolidated has been going around, but it has been emphatically denied by the officers of one of the companies. These properties are situated in the neighborhood of the Isabella Company's properties. Several times during the last few years, consolidation rumors regarding the Bull Hill properties have come up, but each case has proven false alarm.

GEORGIA.

LUMPKIN COUNTY.

Etowah Gold Mining Company.—This company has been incorporated to mine gold in this county. The capital stock is \$10,000, in \$5 shares, with power to increase to any sum not exceeding \$1,000,000. The incorporators are W. P. Price and W. J. Worley, of Dahlonega; Craig R. Arnold, J. F. Betz, Jr., and J. S. Van Niede, of Philadelphia.

IDAHO.

IDAHO COUNTY.

(From Our Special Correspondent.)

Crooked River Mining and Milling Company.—This company has just about completed the installation of a 20-stamp mill. Their mine is opened on a vertical dike of quartz porphyry that courses through the regional granite. The dike is from 200 to 500 ft. wide, very much impregnated with secondary quartz, together with seams and bunches of iron oxides. It is estimated by practical mining men who have sampled it that this dike will yield an average milling value of \$5 per ton for 200 ft. wide and that it contains richer shoots several feet in width that will run very much higher. This property is owned by Butte, Mont., capitalists, and is situated on Crooked River, only 12 miles from Elk City.

Sherman.—This property is situated on Seigel Creek, 6 miles south of Elk City. It is developed on a vein of white quartz well sprinkled with iron oxides 20 ft. wide and carries an average value of \$15 per ton. The vein stands at an angle of 70 degrees, and is a contact between wall of granite and porphyry. It is developed by two tunnels, both driven on the vein. The lower tunnel is 500 ft. long and has gained a face depth of 180 ft. At 430 ft. in this tunnel entered a shoot of bonanza ore, that is well defined and carries an average width of over 3½ ft. and an average value of over 500 per ton in free gold. At 500 ft. in these values had been continuous from the time the shoot was struck, and at that point the shoot was 4 ft. wide in the breast and gave an average value of \$1,000 per ton across the whole 4 ft. This shoot did not crop through to the surface, but the pitch and permanent nature of the vein and the length of the shoot insures it considerable vertical strength. The property is being worked by the original owners. They consider they have \$1,000,000 worth of ore practically in sight in this shoot already and the end of it yet to find.

The ore is perfectly free milling and produces beautiful specimens. The dump from this shoot glitters with native gold after a rain. Considerable excitement prevails over this development and a great many claims are being located, and it is probable that the Thunder Mountain boom will be repeated here during the coming winter.

ILLINOIS.

(From Our Special Correspondent.)

Illinois Coal and Coke Company.—The mining engineers and expert auditors, who have been in this field for the past two weeks examining the books, titles and mines of the different coal companies, under the direction of Mr. Newton Jackson, of Philadelphia, Pa., the promoter at the head of the Illinois Coal and Coke Company, have finished their work and gone, but have as yet had no time to complete their reports. As the options expired on September 1, Mr. Jackson has asked for a further extension of 60 days to complete the details of the transaction, and this has in most cases been granted, and now the operators are guessing again. The Woodside Coal Company, Mr.

Edwards Brown general manager, has refused the extension, however, making another company out of the deal, for the present at least.

JO DAVIESS COUNTY.

Benton Mining and Milling Company.—This company has been incorporated by Charles L. Moulton and others, to operate a lead mine near Galena.

Galena Mining and Milling Company.—This company, lately organized, has bought the Ryan property, near Galena, and will begin work at once.

INDIANA.

DELAWARE COUNTY.

(From Our Special Correspondent.)

Ohio & Indiana Oil Mining Company.—This company, which recently purchased the leases and wells of the Smith-Neeley Company in the Parker City field for \$200,000, has refused an offer of \$450,000 for the property from Eastern capitalists. The company has 29 producers and 5 wells drilling and no dry holes.

GIBSON COUNTY.

(From Our Special Correspondent.)

Princeton Coal and Mining Company.—This company has elected the following officers: L. J. Oswald, of Princeton, president; L. C. Embree, vice president; A. M. Ogle and W. H. Hubbard, of Indianapolis, treasurer and secretary, respectively.

GRANT COUNTY.

(From Our Special Correspondent.)

August has developed into a record-breaking month for oil operations in the various Indiana districts. There were 402 wells completed and 6,435 bbls. production, which is an increase over July of 55 wells finished and 680 bbls. production. There are 352 wells now drilling.

Pacific Oil Mining Company.—This company, of Wilmington, Del., has filed articles of incorporation. Its capital stock is \$1,000,000. The value of the company's business in this county is \$100,000, and it is represented by George W. Thompson, of Marion.

JAY COUNTY.

(From Our Special Correspondent.)

Illinois Oil Company.—This Chicago company has opened a 200-bbl. well near Geneva. This company was recently incorporated with a capital of \$100,000. L. N. Lethen heads the board of directors.

Kerlin Oil Mining Company.—This company drilled in a big well August 21, west of Montpelier and is making 300 bbls. a day.

PARK COUNTY.

(From Our Special Correspondent.)

Columbia Clay Product Company.—This company has been incorporated by Indianapolis men with a capital stock of \$100,000. The company has secured 90 acres of land near Rockville, and will proceed to build a large factory. The land is clay and shale, underneath which is a large deposit of soft coal. This coal will be mined to operate the factory, which will have 25 or more kilns. The company will manufacture hollow fireproof tiling and hollow conduits. Frank Kessing, formerly with the National Fireproofing Company, of New York, will manage the new Indiana company's plant, which will have a capacity of 150 tons a day. The economy of the plant and business is found in the fact that both the raw material and the fuel for the plant are taken from the same spot. J. S. Cruise is president of the company.

PIKE COUNTY.

(From Our Special Correspondent.)

W. C. Lobby & Sons have purchased the Winslow Gas and Coal Company's coal-works south of Petersburg for \$110,000, the largest deal of the kind ever made in this county. Mr. Lobby has been general manager of W. S. Little's coal-works in this county. The purchasers or new firm will immediately put \$25,000 worth of new machinery in the works and make other repairs.

MAINE.

OXFORD COUNTY.

Mount Glines Gold and Silver Mining Company.—This company has been organized to work a property in Milton plantation, about 7 miles from Rumford Falls. The company owns a tract of about 300 acres, on which it is claimed that several veins have been located. The officers are: President, Dr. J. Abbott Nile; treasurer, Ralph T. Parker; clerk, A. E. Morrison; directors, the above named officers, Stanley Bisbee and W. N. McCrillis.

MICHIGAN.

COPPER.

Adventure.—The intake tunnel, by means of which the water supply for the Adventure Mill will be secured, has been drifted out nearly 1,000 ft. under the bed of Lake Superior and is practically completed.

The work of excavating a large room at the further extremity through which pipes from the water above will project has been started. When the room is completed holes will be drilled through the 20-ft. floor of sandstone. It is said that one head in the Adventure Mill will go into commission, and the second and third as soon after as possible.

Lake Superior Concentrating Company.—As soon as the improvements now under way on the plant of this company, which is working over the old Franklin sands, opposite Houghton, are completed the mill's capacity will be doubled. An addition is being built and operations will not be resumed until fall. No change of methods in reworking the sands will be made. New machinery will be installed to add to the capacity. The mill has a good water supply.

Winona.—Five drills are now at work in this mine, and good progress is being made.

Wolverine.—The Wolverine Mill went into full commission last week, and from now on the two heads will operate continuously. The old one-head mill at the mine has been closed down. The old mill will be dismantled at once and the machinery removed to the Phoenix Mill site on Eagle River, 2 miles northwest of the Phoenix Mine.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

Joplin Ore Market.—A great deal of ore was loaded last week which had been purchased in the preceding weeks, but there was a distinct diminution in the activity of the market. Buyers were not so active and were talking lower prices, but actual instances of declines in value were comparatively few. Some of the producers refused to sell at the quotations offered early in the week, but acceded to the terms in time for their ore to be included in the week's shipment. The highest price reported during the week was \$39.50, which was paid for the ore from the Perkins Zinc Company. On the assay basis the choice lots sold for \$35 and \$36 per ton on a basis of 60 per cent. ore, but poor lots sold as low as \$33 per ton on the 60 per cent. basis. It was on these inferior lots that the decline in value occurred. Lead sold all week at \$49 per ton. During the corresponding week last year the shipment was less by 1,065,080 lbs. of zinc and the value was less by \$56,265, but the lead sales were greater by 180,540. For the corresponding eight months of last year the zinc shipments were less by 13,339,230 lbs., and the value was less by \$1,081,837, but the lead sales were greater by 2,986,860. Following are the sales from the various producing camps of the Joplin District for the week ending August 30, 1902:

	Zinc, lbs.	Lead, lbs.	Value.
Joplin	2,907,510	353,960	\$53,000
Galena-Empire	1,181,390	102,410	20,059
Cartersville-Webb City	1,885,100	323,590	38,004
Duenweg	1,287,230	48,470	22,990
Aurora	767,350	12,140	11,131
Spurgeon	239,230	39,060	3,329
Prosperity	387,820	44,880	7,867
Neck-Alba	414,270	19,020	7,509
Zincite	509,880	.....	8,923
Oronogo	229,850	4,960	3,671
Grauby	389,000	59,000	5,105
Central City	157,820	86,740	4,334
Carthage	246,420	10,560	4,448
Carl Junction	388,500	.....	6,800
Cave Springs	77,040	.....	1,213
Reeds	40,470	.....	688
Sherwood	28,420	.....	483
Peoria	.....	21,980	523
Total	10,837,390	1,166,770	\$200,191
Total, 8 months	364,158,570	43,109,400	\$6,372,472
Zinc value, week	\$172,596	lead, \$27,596	zinc value, 8 months, \$5,416,245
lead, \$956,227.			

One of the richest ores ever found in the Joplin District is being taken from the Doogan Diggings on the Rob Roy tract, southeast of Joplin. The ore assays 64.93 per cent. zinc with just a trace of iron and lead. On present basis this ore would sell at \$41 per ton. The face of ore has not yet been fully explored, but it is of great extent and will undoubtedly develop into a bonanza.

The 20 acres east of the Porto Rico Mining Company, just east of Joplin, has been sold by C. C. Carrick to Chicago parties for \$30,000. Carrick lived in this district long before ore was discovered and the land was patented from the Government. It has never been prospected, but the new company proposes to commence active mining operations. The transaction has already been involved in litigation for J. L. Morgan, a well-known broker, has brought suit against Carrick for \$6,000 commission.

New Corporations.—The Consolidated Troup Mining Company, with a capital of \$1,000,000, has been incorporated at Dover, Del., by John Morton, Eugene Lumelius, H. P. Wyatt, W. H. Baker, Frank Morton, William Berry and Lester M. Hall. This is the syndicate that has purchased the Troup, the Tom S., the Hudson and other mines in this district. The Gaddes Mining Company has been formed with a capital of \$20,000 by St. Louis parties to operate the Gaddes Mine.

B. & B. Mining Company.—The property of this

company, formerly the Kimberly, south of Carthage, has been sold for \$15,000. H. Ryus, of Joplin, and J. H. Bartles, of Bartlesville, I. T., made the sale. The name has been changed to the Indiana Mining Company, which makes four companies of this name operating in the district.

MONTANA.

CHOTEAU COUNTY.

(From Our Special Correspondent.)

Alder Gulch Mining Company.—E. W. King, of Lewiston, a mining man largely identified with mining operations in Fergus County; O. P. Zortman and George Putman, of Landusky, have formed this company with a capital of \$200,000, and will put in a cyanide mill on the Alabama group of claims near Landusky, in the Little Rockies. The mill will be a 100-ton affair, and will be completed this fall. This will be the first mill in the Little Rockies or in the county. It is about 70 miles from the Great Northern Railroad. A number of cars of rich gold ore have been sent to the smelters. It is claimed that there are large bodies of ore in the Landusky District that are susceptible to treatment by cyanide.

FERGUS COUNTY.

(From Our Special Correspondent.)

Barns-King.—This property, at Kendall, under the management of E. W. King, is treating 110 tons per day. The mill has just been doubled in its capacity, and will treat in the future 220 tons daily by cyanide.

Great Northern Mining and Developing Company.—An explosion of the air compressor at this property at Gilt Edge occurred recently, 2 men being killed by suffocation and 2 others being rescued in time. The 4 men were working in the shaft at the time of the explosion. When the rescue party reached them all were unconscious, but 2 were revived. The cyanide mill is treating 150 tons per day.

Kendall.—The cyanide mill on this North Moocasin property, near the new mining camp of Kendall, is treating 300 tons per day.

GRANITE COUNTY.

The Sally Ann and Brother Jonathan claims, which adjoin, are developed by over 1,500 ft. of tunnels, which cut the two veins at different points at a depth of 350 to 400 ft., showing ore streaks of from 2 to 3 ft. that sample and mill \$15 in gold. The 10-stamp steam mill started up on August 5. It has a cyanide plant.

Iroquois Gold Mining and Milling Company.—This company is working the properties formerly owned by the Montana Gold Mining and Milling Company, situated on the headwaters of Wisconsin Creek, at an altitude of from 8,700 to 10,000 ft. Superintendent O. F. Wright has been in charge of the mines for the past seven years.

Sullivan & Boyer.—J. U. Loomis has leased this property near Pioneer, and will erect a stamp mill.

(From Our Special Correspondent.)

Granite Bimetallic Mining Company.—A suit has been filed in the United States Court at Helena by the Montana Water, Electric Power and Mining Company against this company and 21 other defendants to determine the rights of the various claimants to the waters of Flint Creek. The plaintiff company claims 11,000 inches of water from Flint Creek under the Joseph H. Harper, Thomas T. Baker and the Frank D. Brown appropriations. In 1901 the plaintiff company built a stone dam across the creek 30 ft. high, thereby making a great storage reservoir. This is used to generate electric power for use in the mines and mills of the Granite Bimetallic Company. Since the construction of the storage reservoir there are many complaints from the previous users of the waters, and in order to avoid a multiplicity of law suits the company has commenced the present action to determine the rights of each party in interest.

Sunrise.—This property, near Philipsburg, after several years of litigation has again resumed operations at mine and mill. The legal atmosphere regarding the property has cleared up. The last suit was tried before Judge Henry L. Blake, master in chancery, and was won by the interests represented by Charles D. McClure, of St. Louis.

JEFFERSON COUNTY.

(From Our Special Correspondent.)

Basin Creek Placer Mining Company.—This company has increased the capital stock from \$100,000 to \$500,000. The operations of the company are on Basin Creek, 12 miles above the town of Basin. A Philadelphia company some 8 years ago took hold of the property, and after the expenditure of a good many thousands of dollars, by way of putting in hydraulics and a bedrock flume, all operations ceased. Now a new company, headed by E. D. Edgerton, of Philadelphia, and Dr. Cole, of Helena, has taken hold of the property with the intention of reopening it.

Eva May Mining Company.—Work is to resume at this company's property, at Basin. The following of-

icers were recently elected: President, Thomas C. Kelly, of Findlay, O.; vice-president, John G. Mizer, of Carey, O.; secretary and treasurer, George B. Drakenfield, of Basin. Directors—Thomas C. Kelly, John G. Mizer, George B. Drakenfield, George Faulhaber, and Jacob Kuebler.

LEWIS & CLARKE COUNTY.

(From Our Special Correspondent.)

Ontario.—The Boston & Seattle Mining Company, which recently purchased this mine, situated near Elliston, will buy new machinery for both the mine and concentrator. The work of unwatering the property will start at once. W. R. Smith, of Helena, is the secretary.

MISSOULA COUNTY.

Denver & Rock Island Company.—W. T. Hale, of Wallace, Idaho, has bonded this company's property, 6 miles east of De Borgia, consisting of 12 claims. The ore carries silver, lead and copper. Four tunnels are being driven, the longest being in 550 ft.

Oro Monarch Mining Company.—This company, which is operating near DeBorgia, has started 5 stamps on ore from the company's mines, and the other 5 will be in place in a short time. The entire mill will be running in less than 30 days. The company owns two groups of claims. The ore is low grade, but if the 10-stamp mill saves the gold the mill will be enlarged.

POWELL COUNTY.

(From Our Special Correspondent.)

Josephine.—This silver property, purchased last year from the receiver of the First National Bank of Helena by S. C. Alexander and associates, of Kansas City, and situated in the Ontario Mining District, reports a rich strike of ore in the bottom of the new shaft. Twenty tons of the ore, it is claimed, are sacked ready for shipment.

SILVER BOW COUNTY.

(From Our Special Correspondent.)

F. Augustus Heinze and the other defendants have filed an answer in the district court in the suit that was brought against them by Frank Cash. The plaintiff claimed that he was damaged in the sum of \$6,000 by mining operations that were carried on by the defendants under his property in the Kemper Addition. The defendants deny that they have injured the property of the plaintiff by improper methods in mining.

Butte Reduction Works.—The destruction by fire of the reverberatory department at these works caused a loss of \$30,000. No material damage occurred to any other department of the smelter. Preparations for rebuilding the furnaces are under way. Inside of 3 weeks it is thought everything will be in running order again. Only the furnaces proper show much damage; the stacks seem to be intact.

Pittsburg & Montana Copper Company.—Prospecting at the property of this company is confined at present to work with a diamond drill. This was formerly the Farrell Copper Company. The operations are on the flat east of Meaderville.

Ticon.—The shaft house and hoisting works at this property were destroyed by fire August 24. The mine is situated north of the Specular. James A. Murray, owner, will rebuild at once. The machinery was new, having been in use but a few months. The loss will be fully \$8,000. The fire is supposed to have caught from a stove in the change room. The 20 men employed as miners have been put to work rebuilding.

NEVADA.

ELKO COUNTY.

(From Our Special Correspondent.)

Deater.—It is stated the sale of this property at Tuscarora is again being promoted and that the sampling is put in the hands of A. A. Blow, formerly of Leadville, Colo., and for some time in the Transvaal. The price talked of is \$1 per share or \$500,000.

STOREY COUNTY—COMSTOCK LODGE.

Savage Mining Company.—At the annual meeting last week 93,528 shares were represented, and the following directors elected: George R. Wells, Charles H. Fish, Herman Zadig, William Bannan and George C. Sneider. George R. Wells was elected president; Charles H. Fish, vice president; John W. Twigg, secretary, and Harry M. Gorham, superintendent.

NEW YORK.

ESSEX COUNTY.

The old iron mine near the railroad station at Keene is being reopened. The old workings are being cleared out and are to be extended. The property is under charge of Zebulon N. Benton, who has organized a company in Cleveland, O., to purchase the property.

ST. LAWRENCE COUNTY.

Kearney Iron and Mining Company.—This company has been organized with \$150,000 capital to open and operate the old Clark and Pike iron mines in the towns of Rossie and Gouverneur. The incorporators

are J. B. Johnson and O. J. David, of Gouverneur; Frederick Crane and S. L. Mershon, of New Jersey. The officers are: President, J. B. Johnson; vice president and treasurer, Frederick Crane; secretary, S. L. Mershon. Men have been put at work clearing out the old mines.

OREGON.

JOSEPHINE COUNTY.

Golden Drift Mining Company.—A number of Eastern stockholders recently visited this mine near Grant's Pass. The company is now building a dam 650 ft. long in order to utilize the water power of Rogue River.

(From Our Special Correspondent.)

Copper Stain.—This mine, in the Mount Reuben District, is now opened to a depth of 500 ft., presenting a 6-ft. vein. The company is building a good wagon road to the property and is preparing to put in a 10-stamp mill.

Gold Bug.—This property is situated on Mount Reuben and operates a 5-stamp mill. Development proceeds by three levels, opened to a depth of 700 ft., and values average \$18.

Golden Drift.—Placers in Dry Diggings. A new power dam is nearly completed across Rogue River, below the diggings. Will pump water to five giants and also furnish water for irrigation.

Granite Hill.—This mine, in Louse Creek District, has a 5-stamp mill. A new strike is reported at a depth of 130 ft. in drift from the main shaft. Ledge has width of 8 ft. Values mostly free milling; average, \$20.

PENNSYLVANIA.

ANTHRACITE COAL.

(From Our Special Correspondent.)

There have been no material developments in the strike situation during the week. The operators are gaining ground slowly but perceptibly. The aggressive body of the strikers are showing a bold front, but there is an undercurrent of uneasiness and despondency among the more thoughtful and responsible miners which they cannot and do not, as a matter of fact, try to conceal. The distribution of the strike fund goes on, but the amount of tangible relief which it is bringing to men who as a class earned from \$60 to \$100 a month may be realized from the fact that the ticket issued to an unmarried man is good for store provisions for \$1.50 for two weeks, and that of a married man ranges for the same period from \$3 to \$4.50, according to the size of his family, his standing in the union, the possibility of his defection, and other personal factors which a system of systematic espionage has placed in the hands of the distributing staff.

President Mitchell claimed the other day that the men who are working in the mines were imported "scabs." In an interview, Superintendent Tobey, of the Lackawanna, and Superintendent Rose, of the Delaware & Hudson, emphatically deny Mitchell's statement. Mr. Tobey says that his company has not imported a single hand; that all the men working are old miners, who had to produce their certificates before they were permitted to resume work. Mr. Rose's denial was in words to the same effect.

It is the general opinion of those who are familiar with the situation around Panther Creek that General Gobin's order to shoot has averted what might have been a terrible scene of bloodshed.

Labor Day passed off very quietly in the anthracite regions. There were large processions and the usual marching and counter-marching, but, with the exception of one or two localities, there was neither rowdiness nor ruffianism on a particularly noticeable scale. There was no cessation of work at the mines and washeries in operation in any section.

The Lackawanna began operations at Nanticoke on Labor Day with 100 men, all old hands, according to Superintendent Phillips. It is one of the biggest collieries in that region. No trouble attended the resumption. This makes 5 collieries and 5 washeries which the company has at work. The Bellevue washery, which was burned down some time ago, will begin operations again on Friday, 90 days from the date of the fire. It was expected that the Marvin, belonging to the Delaware & Hudson, would be operated on Tuesday. For some reason the colliery did not start, but it is certain that work will be resumed some day during the week. It is estimated that the washeries and collieries in the Lackawanna Valley are producing about 15,000 tons daily.

BITUMINOUS COAL.

Cresson & Clearfield Coal Company.—In this company's mine, at Frugality, a new coal seam has been struck, which is said to be 4 ft. 10 in. thick and of good quality.

SOUTH DAKOTA.

CUSTER COUNTY.

(From Our Special Correspondent.)

Black Hills Porcelain Clay and Marble Company.—The mica mine is paying regular returns into the treasury. A steam bar channeling machine has been

purchased for the lithograph quarry, and shipments of this stone will begin in September.

North Star Mining Company.—The 10-stamp mill has been closed down while water is being brought in from French Creek, the mine water being insufficient to supply the stamps. A gasoline engine is being installed, and the water will be piped $\frac{1}{4}$ mile.

LAWRENCE COUNTY.

Horse Shoe Mining Company.—We noted last week that this company had let the contract for its new 1,000-ton cyanide plant to the Allis-Chalmers Company. The contract for the company's new 120-stamp mill has also been awarded to the Allis-Chalmers Company, Chicago. This mill is expected to handle 1,000 tons of ore per day.

The mill, which will be erected at Terry, near Deadwood, will include a separate crushing plant, located about 500 ft. from the 120-stamp mill. The operation of the crushing plant and stamp mill are as follows: The ore is delivered by rope tramway or railroad cars at the crushing plant in large storage bins, below which are placed two Gates gyratory rock breakers of large capacity. The coal bins are also located at this point. The distance between the crushing mill and the stamp mill is between 500 and 600 ft. The crushed rock and coal are delivered to the stamp mill by means of a 24-in. belt conveyor, so arranged as to deliver the ore at any point in the bins back of the stamps as may be desired or the coal in special bins placed in front of the boilers. The power plant for the crushing mill consists of a Reynolds corliss engine, with standard tubular boilers, heater, etc. The stamp mill, as stated, consists of 120 stamps, each stamp weighing 1,000 lbs. The mortars are of special construction, double discharge and so constructed as to make the smallest possible amount of slimes. The power for the stamp mill is placed in the center of the mill and consists of a Reynolds tandem compound corliss engine, tubular boilers, etc. The stamp counter-shaft is driven by belt from the engine, 60 stamps being placed on either side of the power plant. The crushed ore is delivered to the cyanide mill, where the product is treated in steel tanks as usual. The entire mill was designed by Mr. C. M. Fueller, of Denver, Colo., who acted in the capacity of consulting engineer for the Horseshoe Mining Company. The mill is a model in design, and when in operation will be one of the most economical mills in operation ever built in the Black Hills country, which is noted for its low costs in the treatment of low-grade ores.

PENNINGTON COUNTY.

(From Our Special Correspondent.)

Eagle Rock Mining Company.—A New York syndicate has become interested in the company and guarantees to develop the mine and complete the stamp mill. The mill has 20 stamps and only requires a boiler and engine.

Holy Terror Mining Company.—The pumps in the Holy Terror shaft are lifting 600 gal. of water per minute, and it is estimated that bulkheads are shutting off fully 200 gal. more. Diamond drill explorations have revealed an enormous volume of water below where mining is being carried on. Tests with 2-in. pipe with steam gauge attached showed a pressure of 95 lbs.

National Smelting Company.—A majority of the stock has been placed in escrow for delivery to the Horseshoe Mining Company, which is buying it for the smelter at Rapid City. Officials of both companies assert that the deal will be closed.

Tycoon Mining Company.—The 10-stamp mill is being remodeled. A new tunnel has been started near the top of the hill, above the mill.

UTAH.

(From Our Special Correspondent.)

Ore and Bullion Shipments.—The banks of Salt Lake City report the settlements for the week ending August 30 on ore and bullion shipments as follows: American Smelting and Refining Company bullion, \$101,000; gold, silver, lead and copper ores, \$162,700; gold bars, \$8,000; total, \$271,700.

BEAVER COUNTY.

(From Our Special Correspondent.)

Frisco Shipments.—The Horn Silver Company has sent in 2 cars during the week closing August 30, of their high-grade silver ore.

Milford Shipments.—The Sky Lark Mine reports having sent one car to the samplers at Salt Lake during the week ending August 30.

Cactus.—The small 24-ton mill at this mine, four miles from Frisco, is equipped with jigs and tables. The Cactus ores are chalcopyrite in a siliceous gangue, carrying from $2\frac{1}{2}$ to 5 per cent copper, with small values in gold and silver. The mill makes a concentrate that runs about 16 per cent copper. Four sizes of jig product and four sizes of table products are made. No. 1 jig product, $\frac{3}{4}$ -in. size, is $3\frac{1}{2}$ per cent of the total product; No. 2 jig, 3-mesh size is $7\frac{1}{2}$ per cent of the total; No. 3, a 5-

mesh, is $18\frac{1}{2}$ per cent; No. 4, a 10-mesh, makes $17\frac{1}{2}$ per cent; the first size table product is $26\frac{1}{2}$ per cent; second size, $13\frac{1}{2}$ per cent; third size, $3\frac{1}{2}$ per cent, and the fourth size, $9\frac{1}{2}$ per cent. These concentrates are clean and carry a high excess of iron. Samuel Newhouse owns the mine, and A. J. Bettles is his metallurgist.

BOX ELDER COUNTY.

(From Our Special Correspondent.)

Century.—Another bar of gold has arrived, valued at \$3,300, which stands for 2 weeks run. The intervals between shipments are growing much less.

IRON COUNTY.

(From Our Special Correspondent.)

A party, composed of Hon. P. L. Kimberley, of Sharon, Pa., in whose favor the \$2,250,000 option on iron deposits was executed, and two of his townsmen, Messrs. F. H. Buhl and W. L. Wallace, together with John T. Jones, an iron expert; C. A. Mahn, C. D. Porter and Charles T. Rader, together with Hon. I. W. Jones, representing the vendors of the property, have left for Iron Mountain to inspect the recent developments and surface strippings of the big deposit. The party will return some time next week.

JUAB COUNTY.

(From Our Special Correspondent.)

Tintic Shipments.—During the week closing August 30 the following reports have been received from the shippers of this camp: Martha Washington, 2 cars; South Swansea, 7 cars; Mammoth, 16 cars; May Day, 1 car concentrates; Carisa, 12 cars; Gemini, 10 cars; Bullion Beck, 10 cars; Grand Central, 5 cars; Eagle & Blue Bell, 3 cars; Sioux Utah, 1 car; Uncle Sam, 5 cars; Yankee Consolidated, 6 cars; Star Consolidated, 3 cars; Lower Mammoth, 2 cars; Dragon Iron Mine, 16 cars; Mammoth Mill, 2 cars concentrates and 1 bar bullion.

Boss Tweed.—An assessment of 2c. per share or \$5,000 for development work on ore bodies exposed has been levied by the board of directors.

Eagle & Blue Bell.—An option on this property, running to Col. H. G. Heffron, at \$2.50 a share has been ratified by shareholders.

Grand Central.—Ores are being raised from the latest strike in King William territory which run well.

United Sunbeam.—This property has been closed down owing to the inability of the pumping plant to handle the flow of water. The property is owned by Keith & Kearns.

Yankee Consolidated.—The annual meeting has finally been held, with 465,445 shares out of the 500,000 represented. J. E. Du Bois was elected president, L. A. Amsden secretary-treasurer, O. Heyward vice president, and J. E. Frick and H. E. Edwards directors. Dr. Franklin has withdrawn from the management, but is still a shareholder.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

Alta Shipments.—The Columbus, of Alta, reports the sending of 1 car of ore to the samplers for the week; the Maxfield, of Big Cottonwood Canyon, reports 2 cars.

Bingham Shipments.—For the week ending August 30 the Neptune Mine sends 8 cars ore, the Bingham Copper and Gold reports 5 cars, the Green Grove 1 car, the New England Company 1 car and the Storey 4 cars.

Dalton & Lark.—A significant strike has been made in this territory. The conclusion that copper once underlaid the surface, gold and silver lead ores below the water level, has apparently been verified.

United States Smelter.—Fires have been started at this plant in the valley south of Salt Lake City to dry masonry, etc.

Utah Consolidated.—A total of 5 cars of bullion, or 300,000 lbs. copper, was shipped East to the refineries during the week ending August 30.

SUMMIT COUNTY.

(From Our Special Correspondent.)

Park City Shipments.—For the week closing August 30 the following consignments have been sent to the sampler by the various producers of the camp: Ontario, 1,132,310 lbs. ore; Daly-West, 3,341,150 lbs. ore; Anchor, 201,660 lbs. ore; Silver King, 1,875,472 lbs.

California.—Superintendent Getsch reports that an important disclosure has occurred in the lower tunnel, a surprise for the management. J. W. Neill has been retained as consulting engineer.

Comstock.—It is understood this mine will soon install an up-to-date concentrator.

Mackintosh Sampler.—The building at Park City is now completed, and some of the machinery already installed. The engines are being placed.

Silver Star.—It is reported an Eastern syndicate has rounded up the majority of the stock and that

the 10 claims of the Himalaya Group and of the Kennedy Group are included in their plan for deep development.

Wabash.—Col. N. Treweek is reported as saying "The Ontario south vein has been cut on the 600-ft. level and that a cross-cut had been run 28 ft. and is being extended to the foot-wall, where the mass ore may lie."

Wabash Mining Company.—The directors have approved the purchase of the Storey Group at Park City, which was made by the president, Col. N. Treweek, and W. M. Ferry for a consideration of \$60,000. Part payment has been made to Peter Shanley, vendor. An important strike is recorded in the No. 2 drift on the 600-ft. level, showing as much as 12 ft. of ore.

TOOELE COUNTY.

(From Our Special Correspondent.)

Stockton Shipments.—For the week ending August 30 the Cygnet, 1 car; Ophir Hill, 27 cars, and the Hidden Treasure, 4 cars.

Consolidated Mercur.—The management is driving rapidly toward the Ingot line, from which they are distant about 200 ft. The values found along the drive run between \$7 and \$20.

Fish Springs.—The Utah reports the shipment of 2 cars of high-grade ore for the week.

Honerville.—It is quite likely the long drain tunnel will be abandoned for the present unless a greater show of co-operation is made by the neighbors toward sharing in the expense.

Sacramento.—The first clean-up of the new mill is in progress. Superintendent Cochler will install the retort once employed at the Marion Mine across the gulch next month.

West Dip District.—Redemption period having elapsed, the consolidation of the Daisy-Helvetia-Omaha La Cegale is likely to take place. The Daisy is, it is understood, held by the Bank of Commerce and John Dern, of Salt Lake, and Eben Smith, of Colorado; while the Helvetia is held by a Mr. Duncan, of New York; Robert D. Evans and other Massachusetts men control Le Cegale, and Walker Brothers, of Salt Lake, control the Omaha.

WASHINGTON.

(From an Occasional Correspondent.)

A field of anthracite coal has been found in the Cascade Range, Washington. There are altogether 6 veins, the smallest 6 ft. and the largest 8½ ft., the outcrop of which can be traced for miles. This coal has been analyzed by William M. Curtis, mining engineer, of Detroit. He reports that its analysis is very similar to that of the anthracite of Bernice, Pa. It has a distinctly bituminous fracture. This coal is suitable for domestic and steam purposes, burning without smoke. Following is an analysis of the coal, together with that of Bernice and Lehigh for comparison:

	Lehigh.	Bernice.	Washington.
Fixed carbon	81 to 94	(average) 83.95	87.00
Volatile matter	2 to 8	5.75	5.44
Ash	3 to 12	9.34	7.00
Moisture	—	0.96	0.56
	100.00%	100.00%	100.00%

The above analysis is given on selected coal, though most of the material is nearly free from slate. Mr. Curtis is interested in the property and is negotiating for capital for its development.

FERRY COUNTY.

(From Our Special Correspondent.)

Republic Camp is duller to-day than ever before in its short history. The reason for the depression is the great difficulty experienced in marketing the ore from the mines, many of which have had to suspend operation in consequence thereof.

California.—High grade ore is being stoped for shipment. A considerable quantity of second-class ore is now on the dump awaiting lower rates of transportation than are now obtainable.

Gold Ledge.—The tunnel was driven 1,200 ft. without striking the vein. Some cherty looking quartz was found in the floor of the tunnel, about 20 ft. back from the breast, and a drift has been started at that point. For the present the work on the main tunnel is suspended.

Tom Thumb.—Everything about this mine was put in shape for stoping and shipping ore. The Washington & Great Northern Railway had completed its roadbed and track to the mine, but does not run within 4 miles of the Granby Smelter, at Grand Forks, B. C., and consequently can not deliver the ore at that point. Its charge for hauling to any other smelter prohibits the shipment of the ore. The Republic & Kettle Valley Railway has not yet built a spur to this mine, and can not build one in a distance of less than 2 miles. Hence the pump has been raised from the 400 to the 265-ft. level and the operation of the mine suspended.

North San Poil.—Teams and wagons are engaged hauling 100 tons of ore to the Republic & Kettle

River Railway for transportation to the Granby Smelter, at Grand Forks, there to be smelted for the purpose of testing its particular value as a flux. Similar quantities are to be shipped from other mines in the camp for the same purpose.

Princess Maud.—There are 25 tons of ore on the dump recently raised out of the mine for shipment to the smelters. An upraise is going up on the pay shoot from the 400 to the 300-ft. level, and another one will be started on the same shoot from the 300-ft. level, to connect with the 200-ft. level. The ore averages about \$35 per ton, in the proportion of 225 oz. silver to 1 oz. gold, being substantially silver ore. The exploration of this mine consists of 2,063 ft. of openings, as follows: Shaft, 92 ft.; crosscut tunnel, 420 ft.; winze, 410 ft.; adit level, north drift, 265 ft.; south drift, 238 ft.; No. 1 sub-adit level, north drift, 55 ft.; south drift, 50 ft.; No. 2 level, north drift, 65 ft.; south drift, 68 ft.; No. 3 level, north drift, 185 ft.; south drift, 65 ft.; No. 4 level, north drift, 125 ft. Considerable open cutting has been done on the cropping of the vein, which has an average width of 5 ft. there, but is 7 ft. wide on the bottom level.

San Poil.—Four men are stoping ore on the intermediate between the Nos. 1 and 2 tunnel levels, but 2 of them will be discharged on account of difficulties about shipping ore. About 250 tons have been stoped, and over 200 tons are on the dump at No. 1 tunnel.

Trade Dollar.—The north drift is in 55 ft. and the south drift is in 47 ft., both on the 300-ft. level. The ore in the north drift is of good shipping value.

Washington & Great Northern Railway.—The road was turned over to the operating department on August 16 and regular passenger trains are now running between Marcus and Republic, Wash.

Zala Consolidated.—A contract has been let for hauling 1,000 tons of ore from this mine in Sheridan Camp to the Sheridan siding, on the Washington & Great Northern Railway, at \$3 per ton, the ore to be delivered 25 or 30 tons daily until the contract is completed. Work will be resumed in the mine immediately.

WEST VIRGINIA.

POCAHONTAS COAL-FIELD.

A despatch from Bramwell, W. Va., September 2, says: "The mines of the Pocahontas Collieries Company are on fire. This morning strikers applied the torch to various portions of the mine near the west entrance, which is on the Virginia side. At 2 o'clock this afternoon officials of the Pocahontas Company claimed that the fire in their leading mine was practically under control and they apprehended but little more damage. Three strikers are reported injured, the result of a conflict with the guards soon after the fire was discovered. The mine in which the fire is in progress is known as the Baby Mine and is the same one in which 20 miners and a number of officials lost their lives several months ago."

WYOMING.

SHERIDAN COUNTY.

(From Our Special Correspondent.)

Little Big Horn Gold Mining Company.—This company, operating near the town of Sheridan, is placing machinery on the property. The company reports the finding of a lead of gold ore.

UINTA COUNTY.

(From Our Special Correspondent.)

Jager Oil Company.—The gusher struck by this company is running about 100 barrels per day. A pipe line from the well to Leroy Station, on the Union Pacific Railroad, is being built. This line will be 4 miles in length. The well is not far from Spring Valley.

FOREIGN MINING NEWS.

AFRICA.

NATAL.

The coal production of the colony for the month of June was 49,188 tons, an increase of 3,994 tons over June, 1901. The number of men employed was 4,017, of whom 192 were whites, 1,885 negroes and 1,940 East Indians. The coal exported for the month was 712 tons, and 20,626 tons were sold to steamers at the port of Durban.

TRANSVAAL.

The report of the Transvaal Chamber of Mines for June shows that in that month there were 37 mines at which work was in progress. The total number of stamps running was 2,130, and the average duty was 4.89 tons per stamp per day. The total rock hoisted was 334,127 tons, of which 16.7 per cent was sorted out as waste. The total ore sent to mill was 282,953 tons; tailings treated by cyanide, 201,603 tons; slimes treated, 41,090 tons. The total yield in fine gold was from mill, 87,840 oz.; from tailings, 45,635 oz.; from slimes, 3,976 oz.; from concentrates and by-products, 5,330 oz.; total, 142,781 oz., an average of 0.5 oz. per ton crushed.

CANADA.

BRITISH COLUMBIA—VANCOUVER ISLAND.

Crofton Smelter.—This plant, owned by the Northwest Smelting and Refining Company, is situated on Osborne Bay, 11 miles by railway from the Leonora Mine, on Mount Sicker, about 40 miles by railway from Victoria and about 50 miles by water from Victoria. James Breen, of Spokane, formerly of the Trail, Northport and Butte smelters, is the president and general manager of the company, with H. C. Belling, also formerly of the same company, as assistant manager and metallurgist in charge. The smelter buildings consist of boiler house, engine house, sampling mill, furnace, converting and copper buildings. The system of trackage from the wharf connects with the narrow gauge railway from Mount Sicker, about 1,000 ft. from the sampling mill. Between this connection and the sampling mill are situated the track scales, with a capacity to weigh 60 tons. From these track scales the cars containing ore will be run up a trestle, built over the receiving ore bins. Into these ore will be dumped and drawn from the bottom of the bins through automatic action gates into ore cars. Between the sampler and the receiving bins a distance of about 30 ft. intervenes, which is floored over and on which is placed a set of Fairbanks ore scales. After weighing ore in buggies it is discharged into a large Blake crusher set in a pit in the foundation of the sampler. From this the ore is carried by elevators to the upper floor of the sampler building, where it passes through the automatic sampler, and the portion retained for sampling is passed through 2 sets of rollers and crushed to extreme fineness, quartered, and samples taken for assay. The other portion of the ore passes from the sampling mill through shoots into the delivery bins, situated on the opposite side of the sampler from the receiving bins. The sampler building is 80 ft. high, and the mill has a capacity to sample 1,000 tons per day of 24 hours.

The furnace buildings are located about 50 ft. to the east of the delivery bins, a portion of the intervening space being occupied by the masonry dust chamber. This dust chamber extends to the north about 200 ft., where it connects with the circular brick stack, which is 120 ft. high and 12 ft. in diameter. The charging floor of the furnace building is on the same level as the top of the dust chamber and the platform under the gates of the delivery bins. The ore is taken from the delivery bins in charging barrows and mixed with the proper portions of fuel and flux and dumped into the water jacket smelter.

In the power house are installed dynamos for generating electricity to light the works, power and blowing engines and all the machinery necessary to run the plant. In the boiler house are three 200-h.p. boilers. In the furnace building are installed a large water jacket smelter, with capacity to treat 350 tons of ore per day, a cupola furnace for use when a second smelter is considered desirable to produce a higher grade matte before converting and a Garretson furnace having about the same capacity as the water jacket smelter.

The plant has been erected for custom work, but a contract has been made for the entire product of the Leonora Mine, at Mount Sicker, as a base of supplies. Besides this, ores will be purchased where it is possible to obtain them and delivered to the smelter profitably. The latest improved unloading facilities, with bunkers, will be arranged on the wharf, at which the largest vessels afloat can tie up. The harbor at Osborne Bay is one of the best on the east coast of Vancouver Island. The channel is deep and the entrance to the harbor is connected with the deep water channel, so that the largest vessels can approach from either the north or the south with perfect safety.

The sampling mill was started up at Crofton the latter end of June, and at present there are some 4,000 tons of ore being roasted in open heaps in the roast yard to the west of the receiving bins, awaiting the blowing in of the smelter, which is expected to take place immediately.

NEW ZEALAND.

The Mines Department reports the exports of gold and silver from New Zealand for June and the half year ending June 30 as below, in ounces:

	Gold.		Silver.	
	1901.	1902.	1901.	1902.
June	43,067	26,865	38,796	42,744
Six months	217,478	216,801	216,267	323,083

This shows a decrease of 671 oz. in gold for the 6 months, and an increase of 106,816 oz. in silver. The gold reported this year was equal to 196,730 oz. fine gold, or \$4,066,403.

SOUTH AMERICA.

PERU.

Cerro de Pasco Tunnel and Mining Company.—This company has been incorporated under the laws of the State of Maine, with \$12,000,000 capital. The principal stockholders are reported to be H. McK. Twombly and J. B. Haggin, of New York City. This company is to work the famous Cerro de Pasco

MINING STOCKS.

(Complete quotations will be found on pages 331 and 332.)

New York. Sept. 5.

The week began with a holiday, leaving speculators and the investing public time to reflect on the present condition of the stock market. The copper group has been awakened by large exports of the metal, and belief in an improvement in the market. So Amalgamated has rolled up larger sales than usual, selling up to $70\frac{1}{2}$ on Wednesday, while Anaconda was lifted to $110\frac{1}{2}$ per cent ($27\frac{1}{2}$). In both cases prices are the highest in some months.

On curb a little attention was given to the copper stocks, and prices fluctuated at about the old range. Greene Consolidated sold at $27\frac{1}{2}$ @ 29 , Tennessee at $18\frac{1}{4}$ @ $18\frac{1}{2}$; United of Montana, at 33 @ 34 , and White Knob, of Idaho at $21\frac{1}{4}$ @ 22 .

In the gold and silver mine section not enough has been done to attract public attention. Prices fluctuated little and were generally based on those of last week.

Boston. Sept. 2.

(From Our Special Correspondent.)

Another week of dullness must be recorded in the mining share list, and until late to-day things were in the dumps. The trading element in the Exchange seems unwilling to take hold of copper shares, and it is true, as a representative of one of the leading copper share houses says, that there is no use at present in trying to create a movement for the professional element on the floor would be sure to buck in at the start. The regular semi-annual dividend declaration of \$2 by the Wolverine Copper Mining Company last week came as an encouraging sign, but it will take more than this to give encouragement to the public in view of the fact that many other companies have reduced or passed their dividend payments.

The sharp advance in Amalgamated induced some support to the list to-day, though there was nothing approaching activity. New York continues to send bullish utterances on Amalgamated to this center, and the action of the stock certainly makes it look as if the stock were being accumulated.

United States Mining is as buoyant as any stock, yet but 75c. has been added to the price of the stock during the week. The fires have been started at the new smelter, although it is not likely that the production will count much before the new year.

It was noted to-day that few stocks were offered, while buy orders increased. Shannon Copper has fallen to \$9, and it is now said that the company can not hope to make money at the present price of copper. Dominion Iron and Steel has been less conspicuous, while the price has fallen from \$78 to \$75 per share. Mohawk stiffened to \$45.50; Bingham, to \$31.25; Massachusetts, to \$17.50; Utah, to \$21.75, and Calumet & Hecla, to \$535. United States Coal and Oil holds steady around \$17 per share.

Copper Range closes fractionally higher at \$58.37 $\frac{1}{2}$, with Old Dominion quoted at \$17.50; Isle Royale, at \$13, and Osceola, at \$56. The Baltic Mine's output last month was 446 tons of mineral, against 359 tons for July and 340 tons for June. The mill is now stamping 1,250 tons of rock daily, and expects to increase it to 1,400 per day this fall. Quincy produced 1,174 tons of mineral during August, making 8,734 tons produced for eight months. Wolverine reports 323 tons, making 2,184 tons since January 1, and Atlantic, 268 tons for the month, making 2,260 tons of mineral for eight months. The Franklin's August output was 377 tons of mineral.

Colorado Springs. Aug. 29.

(From Our Special Correspondent.)

The market improved enough this week to warrant the conclusion that a permanent gain has been made. The improvement began to manifest itself about a fortnight ago, and the brokers, taking advantage of this, turned last week's market into a stock boom. The settling down of Cripple Creek stocks, which has been going on for 2 years, has apparently reached the limit, and the universal opinion here is that bed-rock has been touched.

Elkton was a lively trader this week, 50,000 shares changing hands between 35 and 37c., to-day's closing sales being at 36c. Internal differences in the board of directors continue, resulting in one of the leading officers disposing of his entire holdings at the market in the past month. The company is \$40,000 in debt to-day and has \$35,000 of machinery due to arrive at the mine early next month. In addition, the management has reduced the working force to 65 men and is at this time resting on the operations of the lessees to turn in royalties sufficient to wipe out the indebtedness.

Salt Lake City. Aug. 30.

(From Our Special Correspondent.)

During this active week the total sales of the Exchange and Open Board amounted to 189,721 shares. While losses were taken during the trading,

conditions generally were in favor of the purchaser, and during nearly all the time the tone was buoyant. Grand Central was a prominent figure and recorded gains from the opening at \$4.98 to the closing at \$5.80. Daly Judge has steadily moved up from \$11 to \$11.60. Daly-West moved forward from the opening at \$51.40 to \$51.80 about the middle of the week. Comstock has done business to the extent of 12,800 shares at \$1.20@ 1.30 . Wabash of Park City has been prominent as a trader with 16,907 shares changing hands at prices between 2.15 @ 3.50 .

Consolidated Mercur still hangs around 2.07 @ 2.05 , with sales of 6,350 shares. Century remained steady at 93@97c., with sales of 2,300, and California pushed out 63,243 shares at 28@38c. per share. The long silent Creole came out with 500 shares at 22 $\frac{1}{2}$ c.

San Francisco. Aug. 30.

(From Our Special Correspondent.)

Business has been moderate, but prices generally firm. There has been no special incident to vary the monotony of the market.

Consolidated California & Virginia sold at \$1.30; Ophir, \$1.15@ 1.20 ; Caledonia, \$1; Silver Hill, 50c.; Potosi, 18c.; Gould & Curry, 12c.; Chollar, 7c.

On the Oil Exchange business was quiet also, but with little change in prices. Thirty-three sold at \$8; Home, 2.75 @ 2.80 ; Sterling, 1.40 @ 1.45 ; Monarch, 15c.; Independence, 4c.

The total sales on the Oil Exchange for the seven months ending July 31 are reported as follows:

Month—	Shares.	Value.
January	187,584	\$81,633
February	288,562	76,447
March	214,293	109,364
April	442,231	239,938
May	213,483	185,594
June	119,435	54,140
July	53,165	35,832
Totals	1,509,753	\$782,948

The heaviest sales were in April, and since that date there has been a gradual falling off to the very low total of July.

London. Aug. 24.

(From Our Special Correspondent.)

The mining market continues within very narrow limits. Some attempt was made to stir up a little interest in the "Coronation Syndicate," which has recently been formed to acquire lands at the far east of the Rand. The syndicate is a joint affair among the leading houses, and the properties contain an extension of some of the reefs. It is not clear which of the reefs they are, but they are admittedly of exceedingly low grade. The stories promulgated as to the vast increase in the mineral wealth of the Rand due to this discovery are greatly exaggerated and are not taken very seriously by people who have direct interests in Transvaal mining shares. The scarcity of labor still causes great trouble, and the reopening of mines is being seriously delayed. The proposition now is to import coolies from the Indies. There is no doubt great dismay among the white population of South Africa at the threatened introduction of additional races of inferior civilization. It is bad enough to be surrounded on all sides with natives, without having an Asiatic population. On the other hand, it is admitted that something of the sort must be done in order to increase the gold output, for on this the prosperity of the country and its chance of recuperation after the war depends more than on anything else. In the meantime it is only natural that the market for South African mining shares should still be in abeyance.

COAL TRADE REVIEW.

New York. Sept. 4.

ANTHRACITE.

Another week has passed without any definite progress made towards settling the strike. Operators and officers of the Miners' Union have put out statements, in which there is nothing new on either side. While, as our readers know, we have not favored the claims of the union in this controversy, we must admit that the autocratic tone assumed by President Baer, of the Reading, appears to us to be a great mistake. It is certainly calculated to turn public opinion against the operators. Public patience has been strained to a considerable extent by the waiting policy, and unwise utterances, like the letter referred to, tend to turn the current of opinion to a degree which may be felt later.

Some washeries continue at work, and it was reported that several collieries would be opened this week. The amount of work actually done continues very small. There has been some disorder in the neighborhood of the colliery, which the Lehigh Coal and Navigation Company is operating in the Panther

Creek Valley, and the strikers are only restrained by the presence of the militia, who are now under strict orders to suppress promptly all attempts at violence.

The conference held this week between Senators Quay and Penrose on the one hand, and Mr. Baer, as representative of the operators, on the other, resulted in nothing, as might have been expected.

The Attorney-General of the United States has given his official opinion that the President has no authority to interfere in the controversy. This merely confirms formally what every one believed. At the same time, with the publication of this opinion, the report made by Col. Carroll D. Wright, Commissioner of Labor, to the President was made public. Some comment on this report will be found on our editorial page. While fair and judicial in its tone, as might be expected from the author, the report is a disappointment. Most people expected that Col. Wright would go into the causes of the strike more fully and make some comments on the claims of both sides. In fact, some claim that the report must have been edited before publication to bring it into the colorless form in which it has appeared.

Labor Day passed without any disturbance in the mining country. The latest rumor which has appeared is that Mr. J. P. Morgan and the Pennsylvania Railroad managers are to take a hand in settling the strike. This is probably worth as much as the many stories which have preceded it.

It is difficult to give any idea of the actual state of prices. There is no wholesale market upon which to base quotations. From New York yards house coal is reported to be selling at \$12 and \$13—in some cases even higher. Some dealers have none to sell, while those who have any refuse to deliver in more than ton lots. In factories and office and apartment buildings the use of soft coal now seems very general.

BITUMINOUS.

The Atlantic seaboard soft coal trade continues active, though the pressure for speculative coals has been relieved in the last few days considerably by the railroads pushing in the coal that has been delayed on their lines. This has reduced the speculative price slightly, say 5c. or 10c., but the demand created by the shortage of receipts of coal at tidewater recently has not held up to any great extent. The car supply has improved and been more steady, thus relieving the tension somewhat.

The labor question seems to be settling itself, by the men gradually getting back to work. There has been some fighting, however, but only to a small extent, which is always the precursor of the end sooner or later.

Somewhat of this character is the outbreak in the Pocahontas District, to which reference is made in our news columns. It will probably result in the termination of the strike in that region.

Trade in the far East is calling for all the coal it can get, though it is thought that most of the producers are way ahead on their contracts. It is known that some small contracts have been entirely filled.

Business along the Sound shows a shortage of coal, and all consumers are trying to get extra cargoes over and above their allotments. Indeed, there seems to be more pressure in this territory than anywhere else.

Trade in New York harbor has been strong, but the pushing of coal along the various railroads has relieved this to a great extent.

All-rail trade is active and calling for all the coal it can get. There are fair stocks in the yards of the consumers, but everybody desires to keep them up as much as possible.

The car supply has been fairly good. Transportation has improved greatly, and is about up to schedule. In the coastwise market vessels are in plentiful supply at nearly all ports.

We quote current rates of freight from Philadelphia as follows:

Boston, Salem and Portland, 65@70c.; Wareham and Portsmouth, 70c.; Providence, New Bedford and Long Island Sound, 60@65c.; Lynn, Newburyport and Saco, 85c.; Bath and Gardiner, 75c.; Bangor, 80@85c. Rates from the farther lower ports are 5@10c. higher than these figures.

Birmingham. Sept. 1.

(From Our Special Correspondent.)

While the production of coal in Alabama has not changed recently, it is admitted that there were not a scarcity of railroad cars there would be a decided improvement. The demand for coal is better, and inquiries indicate that there is to be a steady need for the coal. There is a better price being obtained for the coal, and the demand promises to hold up right along. There are not more than 250 United Mine Workers of America in Alabama idle now. With the exception of a few small mines, the wage scale is in full operation.

The supply of coke is not great enough to meet the demand there is for it. As a consequence, coke is be-

ing purchased out of this State. Work will begin as quickly as material can be placed on the ground at Flat Top Mountain, in Walker County, on 200 coke ovens for the Sloss-Sheffield Steel and Iron Company. The Globe Coal Company will also build 100 ovens near Brookside. Other coke ovens are in contemplation.

The Mississippi River trade is suffering through the scarcity of cars. All the coal equipment of the railroads in this State is in use, and there is need for more cars.

Cleveland. Sept. 2.

(From Our Special Correspondent.)

Conditions do not change in the coal market, but it is evident now that the railroads are incapacitated to a remarkable degree in handling the output of the mines. The shipments away from the Pittsburgh District to the Lakes has been so light that many of the docks here are only chartering vessels when they have the coal with which to fill them. They have chartered vessels before now and have placed confidence in the ability of the mines to forward the coal with which to give them cargoes. These boats many times have been compelled to wait 3 and 4 days before the cargoes could be completed. The shipments of coal by the Lakes have been very light indeed, and the docks from one end of Lake Erie to the other have been lined with tonnage for a month or more. There was some talk of a reduction of the Lake Michigan rate this week, but that was found impossible because of the serious objection of the owners, who considered that a reduction in the rates would not bring any more coal, hence it would be a useless waste. The domestic supply of coal is sufficient, which, however, cannot be said of that of coke. The hard coal supply is very short.

Chicago. Sept. 2.

(From Our Special Correspondent.)

On September 1, prices for bituminous coals were generally revised. The new quotations for delivery on cars at Chicago are: Kentucky cannel, \$4.50; Cannelburg cannel, \$3.50; West Virginia splint, \$3.60; Hocking lump, \$3.35 (an advance of 35c.); Hocking nut, \$3.05; Youghiogheny lump, \$3.55 (an advance of 25c.); West Virginia lump, \$3.47; Brazil block, \$2.55@2.70; Indiana semi-block, \$2.10; smokeless Pocahontas lump and egg, \$4.20 (an advance of 50c.); smokeless nut Pocahontas, \$4 (an advance of 75c.); smokeless run-of-mine (Pocahontas), \$3.50 (an advance of 50c.); blacksmith's coal, \$3.50 (an advance of 25c.); Illinois coals are: Wilmington, \$1.60@1.90; Cartersville, \$1.10@1.55; DuQuoin, \$1@1.30; Springfield, \$1@1.30; Mt. Olive, \$1@1.30; Centralia, \$1@1.20; Wenona, \$1.60@1.90; screenings, 75@85c.

Anthracite stocks are now exhausted so far as the wholesalers are concerned; there is none to be had for love or money. Retailers report general preparations on the part of consumers to use the better grades of bituminous in the coming winter; the belief appears to be general that the strike will not be settled in time to do Chicago any good. At present smokeless grades, Hocking and West Virginia are perhaps selling best, though there is slight choice; all are in very good demand.

An attempt is being made in Chicago to organize the retail coal dealers of the city into a gigantic combination which will reduce to a minimum the expense of delivering coal to consumers. It is apparently the first serious attempt to organize a retail business into a combination of the trust order. There are nearly 400 retail coal dealers in Chicago. It is the plan of John C. Fetzer, who is the promoter of the new organization, to obtain control of 300 of these establishments, located so as not to interfere with one another, in a general system of yards distributed about the city with reference to economy of delivery. Mr. Fetzer confirms newspaper reports of his plans and says he has already secured control of 150 yards. "It is not our intention," he said to a representative of THE ENGINEERING AND MINING JOURNAL, "to crowd out of business any dealer who refuses to come in with us, nor do we mean to try to get a monopoly of the retail coal trade of Chicago, except as we may prove fittest to survive in the struggle for supremacy. We believe that the coal business can be organized so as to secure much greater economy than is at present possible for the independent small dealer. All dealers who have been asked to sell out to the new company have been offered liberal values for their plants and good will; they have been given also a chance to remain for five years at a good salary in charge of their plants, as managers. At present coal dealers on the north side of the city are competing with dealers on the south side and vice versa; the result is heavy teaming expenses across the city, and that could be avoided by having the order filled from the nearest yard to the customer. Our object in retaining the present owners as managers is to secure their customers."

Mr. Fetzer asserts that he has \$5,000,000 capital behind his new venture and that he is simply acting

for the capitalists interested, as agent, rather than on his initiative. Leading dealers in coal, wholesale and retail, say they believe it impossible for Mr. Fetzer to secure a monopoly of the retail coal trade of the city, but admit that such an organization as he proposes would have economic advantages in the way of buying and selling.

Pittsburg. Sept. 3.

(From Our Special Correspondent.)

Coal.—There is some improvement in transportation facilities but the mines have not been in full operation this week. All were closed on Monday, Labor Day, and but few miners reported for work yesterday and a number are idle to-day. It is believed that all will be in full operation to-morrow. As a result the production this week will show a falling off but the shipments will be about the same as last week. A rise in the rivers is looked for soon and the Monongahela River Consolidated Coal and Coke Company and independent concerns are prepared to make some heavy shipments. It is estimated that fully 10,000,000 bush. of coal is loaded and ready to go out. Coal is in demand at down river ports as the strike in West Virginia has materially curtailed the production destined for the lower markets. Prices are firm and large premiums are offered for prompt delivery.

Connellsville Coke.—While the production of coke in the Connellsville Region last week was greater than at any time in its history the shipments were fully 500 cars less than the previous week. The demand for coke is more urgent and prices are much higher. While the circular price for furnace coke remains at \$2.25@2.50 it is reported that as high as \$5 a ton has been paid. A number of sales are known to have been made at \$4 a ton. The Courier in its last issue gives the production for the week at 254,748 tons, an increase of 3,402 tons compared with the previous week and 2,000 tons more than the highest figure ever reached. The shipments aggregated 11,351 cars distributed as follows: To Pittsburg and river tips, 3,963 cars; to points west of Pittsburg, 5,361 cars; to points east of Connellsville, 2,027 cars. This was a decrease of 500 cars compared with the shipments of the previous week.

San Francisco. Aug. 30.

(Special Report of J. W. Harrison.)

During the week there have been three coal arrivals from British Columbia, 9,639 tons; one from Washington, 3,650 tons; total, 13,349 tons. We have to report very light arrivals this week, at the same time the trade is amply supplied. There is no arrival to note from any foreign source, but yards are fairly well supplied. There are several cargoes fully due from Australia, a majority of which have passed out of first hands. Colonial coal freights are reported firm, at from 9s. to 9s. 6d. Still the advance at that end has met with no response here, as the asking price by importers will barely cover the cost of importation. Coast coals from the American and British side are being freely offered at prices slightly shading those of last month. Some large contracts for fuel oil are reported to have been made this week, at prices which will leave a very meagre profit to producers. Consumers seem to be the only parties benefited by the discovery of oil. There seems to be no unity of interest among well owners. Their products are being offered at prices which will certainly leave a minimum profit over the cost of production, if the value of the land from which it is taken is estimated. Coal, of course, is suffering from the low values set on the oil product. The fuel bills for manufacturers should now leave them a handsome profit, as against the cost of same a few years ago, for their products.

Prices.—Our special correspondent reports prices for Coast coals to dealers as follows: Wellington and Southfield, \$8; Roslyn, \$7; Seattle and Bryant, \$6.50; Coos Bay, \$5.50; White Ash, \$5. For Rocky Mountain coals, large lots, quotations are: Castle Gate, Clear Creek, Rock Springs or Sunnyside, \$8.50; Colorado anthracite, \$14. For Eastern and foreign coals, cargo lots, prices are: Pennsylvania anthracite, \$14; Cumberland, \$12; Welsh anthracite, \$13; cannel, \$11.50; Brymbo, \$7.50; Wallsend, \$7.

Foreign Coal Trade. Sept. 4.

There is no change in the situation, and export trade continues dull.

Exports of coal from the United States for the seven months ending July 31 are reported by the Bureau of Statistics of the Treasury Department as below, in tons:

	1901.	1902.	Changes.
Anthracite	1,240,422	619,111	D. 621,311
Bituminous	3,145,845	3,106,092	D. 39,753
Total coal.....	4,386,267	3,725,203	D. 661,064
Coke	242,915	241,653	D. 1,262
Totals	4,629,182	3,966,856	D. 662,326

The decrease in anthracite this year was entirely due to the strike, which has stopped production since

May last. The destination of these exports of coal was as follows:

	1901.	1902.	Changes.
Canada	3,004,244	2,610,067	D. 394,177
Mexico	353,355	331,259	D. 22,096
Cuba	238,207	246,064	I. 7,857
West Indies	210,648	183,296	D. 27,352
Europe	315,786	173,115	D. 142,671
Other countries	264,027	181,402	D. 82,625
Totals	4,386,267	3,725,203	D. 661,064

The decrease in shipments to Canada was entirely in anthracite. The coke exported went chiefly to Mexico. The shipments to Europe are given in detail for the first time in the current Treasury report, and were divided as follows:

	1901.	1902.	Changes.
Belgium	2,937	3,153	I. 216
France	115,114	28,805	D. 86,249
Germany	150	14,808	I. 14,658
Italy	81,728	81,831	I. 105
Holland .....	.....	305	I. 305
Other countries.....	115,859	44,153	D. 71,706
Totals	315,786	173,115	D. 142,671

The shipments to France show a large decrease. Those made to Germany this year were chiefly experimental. The only country with which trade was fully maintained was Italy.

Imports of coal into the United States for the seven months are reported as below:

	1901.	1902.	Changes.
Canada	886,436	936,380	I. 49,944
Mexico	18,893	7,732	D. 11,161
Australia	213,017	201,326	D. 11,691
Japan	2,120	8,176	I. 6,056
Europe	19,642	44,123	I. 24,481
Other countries	22,056	274	D. 21,782
Totals	1,162,164	1,198,011	I. 35,847

Of the total imports this year only 16 tons were classed as anthracite, while none of the imports in 1901 came under that head. With the exception of some Nova Scotia coal, which comes to New England ports, all these imports were received on the Pacific coast.

Messrs. Hull, Blyth & Co., of London and Cardiff, report under date of August 22 that the Welsh coal market remains very steady, and collieries generally are well stemmed for the remainder of the month. Prices keep firm, as follows: Best Welsh steam coal, \$3.90@3.96; seconds, \$3.84; thirds, \$3.66; dry coals, \$3.66; best Monmouthshire, \$3.36@3.42; seconds, \$3.24; best small steam coal, \$2.28; seconds, \$2.10; other sorts, \$1.98. The above prices for Cardiff coals are all f. o. b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f. o. b. Newport, exclusive of wharfage, but inclusive of export duty, and are for cash in 30 days, less 2½ per cent discount.

The outward freight market shows but little alteration, tonnage remains somewhat scarce, but rates show but little quotable change. Some rates quoted are: Marseilles, \$1.10; Genoa, \$1.02; Naples, 1.02; Singapore, \$3.48; Las Palmas, \$1.28; St. Vincent, \$1.56; Rio Janeiro, \$2.94; Santos, \$3.24; Buenos Aires, \$3.24.

IRON TRADE REVIEW.

NEW YORK, Sept. 4.

The general situation in the iron and steel markets is well shown in the local reports which follow. It is sufficient to say that the week has been comparatively quiet, with more or less pressure for immediate deliveries. Foreign iron and steel continues to be freely offered on this market, and advices from the other side show many inquiries for material, so that it is probable that imports will continue on the present scale for some time.

Birmingham. Sept. 1.

(From Our Special Correspondent.)

Spot iron in Alabama, and, in fact, in the entire Southern producing territory, is increasing in value and has already sold as high as \$24 per ton. In regular business some of the larger producers are selling for delivery the last part of the first half of the coming year. The Sloss-Sheffield Steel and Iron Company is still out of the market, having sold as much iron ahead as is desired. According to Secretary-Treasurer McQueen, this company will on September 5 blow in No. 3 furnace, at North Birmingham, making in all 7 of the furnaces owned by the company in full blast. The furnace at North Birmingham will add 5,000 tons of pig iron a month to the production.

The advance in freight rates made by the Southern Iron Committee, at a meeting held in Chattanooga during the past week, will hardly affect the market, as sales have been made covering a large period, and many shipments to be made in the future are protected by the filing of billing orders. The advance in freight rates is 50 cents a ton to all Mississippi and Ohio River points and beyond, except Kansas, Missouri River points, the Territories and Texas, besides the Pacific coast; it does not become effective until September 15. The advance comes as a general result of the advancing pig iron market, and the railroads comprising the Southern Iron Committee declaring their right to participate in the general prosperity.

Quotations remain firm, as follows: No. 1 foundry.

\$18; No. 2 foundry, \$17@18; No. 3 foundry, \$16; No. 4 foundry, \$15; gray forge, \$14.50@15; No. 1 soft, \$18; No. 2 soft, \$17@18. No effort is being made by purchasers to cut these prices, even at long time delivery.

There is no cessation of activity in the finished iron and steel markets in this section. At the steel plant of the Tennessee Company, at Ensley, a large force of men is employed. The stock sheds at the rolling mills still lack assortment, and the producers are asking for little time for prompt delivery on many orders.

Buffalo. Sept. 2.

(Special Report of Rogers, Brown & Co.)

Present indications are that foundries and mills are to have a difficult time to get raw material into their yards this fall. Those who secure and pile up a stock ahead of requirements will be exceptional. Absolutely the only relief now is found in importations by those who find their stock short. It is only reasonable to expect these unfortunate conditions to continue for a time, as the heavy transportation season is almost upon us. We quote, for cash, f. o. b. cars at Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$25.75; No. 2, \$25.25.

Chicago. Sept. 2.

(From Our Special Correspondent.)

Pig iron producers and consumers alike are becoming alarmed about the scarcity of coke and the prospect of indefinite advance in the price of that commodity. Already foundry coke cannot be had for less than \$7 and sales are reported at \$8 @ \$9 in small lots where the demand is urgent and the delivery can be made quickly. There have as yet been no closures of furnaces or foundries in Chicago, but from surrounding points come reliable reports indicating a stringency approaching a famine of coke. The number of furnaces that have temporarily shut down is increasing. Foundrymen are scouring the town for coke.

With iron bought ahead for eight or nine months and contracts made for delivery of foundry products for at least half that time, the outlook is discouraging to the foundrymen.

In consequence of this condition of things and because the trade has little iron to sell, there is not so much business being done by the furnace salesmen as last week. Deliveries are almost wholly for next year—after April or May—and the only real activity is displayed in getting hold of occasional odd lots that can be delivered this year. Quotations for delivery next year are: No. 1 Northern, \$23.50@24.50; No. 2 Northern, \$23@24; No. 3 Northern, \$22.50 @ \$23.50; No. 1 Southern, \$22.65 @ \$23.15; No. 2 Southern, \$22.15 @ \$22.65; No. 3 Southern, \$21.65 @ \$22.15. Any iron that can be delivered this year brings \$1 to \$3 premium over these prices.

Lake Superior charcoal in small lots (the only ones obtainable) commands \$27 @ \$28.

A disposition is now manifest on the part of sellers of pig iron to hold the market down on account of the conditions mentioned. This conservatism is a radical change from the unrestricted willingness to sell that has prevailed for many months. "Business is too good" is now heard from representatives of local furnaces.

Cleveland. Sept. 2.

(From Our Special Correspondent.)

Iron Ore.—Conditions in the iron ore market are changing slightly but slowly. The dispatch is very poor at the lower lake ports, and vessels are often held a week or ten days. This is decreasing the amount of tonnage available at the head of the lakes, and the market there is getting strong. The rates have not changed in the least, 60c. being paid out of Escanaba, 65c. from Marquette and 75c. from Duluth. The selling prices do not change, being \$4.25 for bessemer old range, \$3.25 for non-bessemer old range and bessemer Mesabi, and \$2.75 for non-bessemer Mesabi.

Pig Iron.—Conditions in the pig iron market are becoming more interesting. Orders are light, but production is being curtailed so rapidly that any decline in the demand would not help the consumer for almost another year. Most of the merchant furnaces in the Valleys have banked their fires and are likely to lose at least 2 weeks' output by the coke shortage. This will necessitate the carrying forward into next year a vast amount of material for which orders were placed this year. This will complicate the future situation still further and increase the possibilities of a pig iron shortage during the first half of next season. Prices are \$25, Valley furnace, for No. 2 foundry for spot delivery and \$22 for next year's delivery. Southern furnaces are asking \$18 Birmingham as a minimum. Bessemer and basic producers have no material for sale this year and are not concerning themselves about business for the second quarter of next year, refusing to make quotations except on choice orders.

Finished Material.—Stock quotations on plates as well as mill prices for spot shipment have increased to 2.50c. during the last week, some small orders being taken for that material. It is understood that the plates which are making their appearance at this time had been promised to concerns having contracts. The mills broke away from their contracts when the price

jumped, making the premium a large inducement to a little irregularity in business. The larger mills are still selling into the second quarter of next year at 1.60c. Pittsburg. Sheet sales have been light, although the demand for the intermediate gauges has not slackened in the least. Black sheets, however, are in better demand, the base price out of store being 3.35c. @ 3.50c. for No. 27. For the galvanized product there is even a lighter demand than for the black sheets. The base price of this material is 4.50c. for No. 27. The bar market is active, especially in the steel trade. Most of the mills have sold their capacity for this year, and a few sales have been made entailing delivery into next year. Bar steel prices are 1.60c., Pittsburg, for bessemer and 1.70c., Pittsburg, for open-hearth. Bar iron is in better demand, but the supply is so much in excess of requirements as to offset the tendency of prices due to the large demand. Structural steel is selling heavy for next year, with no material on the market for immediate use. The price is 1.60c., Pittsburg, for beams and channels on which there has been no question.

Old Material.—The starting of the bar iron mills has increased the demand for mill scrap. There is also a better demand for cast scrap since the coke shortage was noted.

Philadelphia. Sept. 4.

(From Our Special Correspondent.)

Pig Iron.—Brokers, with scarcely an exception, stated to-day that while they are writing a good many letters and answering quite a number of inquiries on pig iron, they are doing but little business. They also claim that there is very little iron to be had for early deliveries, nothing for spot delivery and that contracts for long deferred delivery have fallen down to almost nothing. Nominally, prices are higher than last week, but this arises from the fact that there is practically no iron to be had. Quotations for No. 1X foundry may be given at \$24@24.50; No. 2X, \$22.50; No. 2, plain, \$22; standard forge, \$21; basic, \$21. Low phosphorus is quoted as high as \$23.50, and No. 3, Middlesboro, at \$22; Scotch irons at \$23.50@24.

Billets.—Foreign steel is being contracted for, and more or less is dropping in. It is said that billets can be had at \$27.50, c. i. f. It is also said that sales have been made at a lower figure. Much attention is being given to what importers have to say.

Bar Iron.—The demand is confined almost exclusively to small lots and for early deliveries. Refined iron is quoted generally at 2c.; steel bars have sold as low as 1.80c.

Merchant Steel.—There are a number of inquiries in the market from consumers of merchant steel, but they are all for small lots and early deliveries. Quotations are given at 2.10@2.20c., for 1/4-in. plate; universals, 2c.; flange, 2.10@2.15; fire-box, 2.30c.

Structural Material.—Some receipts of structural material from abroad have had the effect of quieting this market, although it is not apparent that any change has been made in quotations. Leading manufacturers do not care for any more business and are not inclined to make any concessions to get it. Quotations are given at 1.70@1.80c., for what may be regarded as optional deliveries. For early deliveries it is of no use to try to quote prices.

Old Rails.—Old iron rails are quoted at \$25, and old steel rails at \$22, with a very little business.

Scrap.—Scrap owners are urged by customers to hurry up the purchase of supplies, particularly of heavy steel and choice railroad scrap. Some urgent buyers have instructed their agents to pay whatever is necessary to get supplies. Lower grade, such as No. 2 light scrap, cast borings and wrought turnings, are moving along at about the usual figures.

Pittsburg. Sept. 3.

(From Our Special Correspondent.)

The freight congestion has been greatly relieved this week. Sunday and Monday being holidays the railroads were able to clear the sidings and yards of loaded cars almost entirely and many empties were placed ready for loading. While the railroads are not yet able to take care of all the freight offered for shipment the situation is much improved. A better production of pig iron is probable for the week. Last week the furnaces in the Valleys did not produce more than 70 per cent of the normal capacity. It is reported that the United States Steel Corporation again opened negotiations with the Blast Furnace Association for its requirements for the second quarter, about 150,000 tons, but no agreement on prices could be reached. While no official information is given out it is believed that the big steel combine has decided to supply its shortage by placing contracts abroad for pig iron. Furnacemen do not seem inclined to shade prices in order to secure a heavy contract when a market at the highest ruling rates for the entire capacity of the furnaces is in sight. Several sales of small lots of bessemer pig iron were made during the week and some doubt is expressed as to the ability of the furnaces to fill all contracts taken for this year's delivery. For the first quarter

of next year the furnaces are well filled and many orders have been placed for delivery in the second quarter. The Valley furnaces are doing but little in basic iron and some fairly good contracts for this grade have been placed in Virginia. Buying of foundry iron for next year has fallen off considerably but prices are firm and somewhat higher this week. While there is a good supply of gray forge there is no special demand, but prices are as firm as at any time this year.

The fall months opened with heavier inquiries for finished material from small buyers and the close of the vacation period, it is believed, will greatly liven up the iron and steel markets. The inquiry for bars has increased considerably during the week. The small concerns that manufacture agricultural implements and that do not make yearly contracts are expected to buy more heavily than usual this fall. The prices for any delivery of steel bars remains at 1.60c. but is subject to a premium of 0.10c. for less than 2,000 lbs. of a size and more than 1,000 lbs. and of 0.30c. for less than 1,000 lbs. of a size. These differentials are closely observed by the mills. Iron bars are in better demand and prices are stiff, ranging from 1.80@2c. The bi-monthly adjustment of wages in the union rolling mills of the country under the sliding scale of the Amalgamated Association of Iron, Steel and Tin Workers is scheduled to be held before the 10th of the month, and the workers are looking for an advance. The scale is based on the average selling price of bar iron and at the last adjustment the pay of the puddlers was advanced to \$6 a ton on a selling price of 1.60c. for bar iron. The puddlers' pay is advanced 25c. a ton and that of the finishers 2 per cent with every 0.10c. a pound increase in the average selling price. It was officially announced from Amalgamated Association headquarters during the week that the rebate proposition, submitted to the tin plate lodges by the American Tin Plate Company, had been reconsidered and had again been voted down.

Pig Iron.—The Valley furnaces have had a great deal of trouble owing to the inability to get coke, but the situation has improved during the past two or three days. Small lots of bessemer pig iron for fourth quarter delivery have been sold this week at \$21.75, Valley furnaces or \$22.50, Pittsburg. The price named to-day is \$22, Valley furnaces. Sales have been made for the first quarter of next year at from \$21 to \$21.75, Valley. There is little demand for gray forge but prices are firm at \$21.25@21.75, Pittsburg, for any delivery. Despite the fact that the buying of foundry iron for next year has fallen off prices are higher and the No. 2 grade cannot be had at less than \$23, Pittsburg, and for prompt delivery from \$24.50 to \$25 is asked. Foundries in this district are not contracting for foreign iron. Middlesboro No. 3 can be laid down in Pittsburg at \$21.

Steel.—The market is quiet. No sales of bessemer billets have been made during the week and it is probable a large lot could be bought for \$31, or less, at mill. Foreign steel is lower, being offered at \$29 delivered to Pittsburg. The plate mills are practically sold up for this year and the mills of the United States Steel Corporation have contracts for delivery for several months of next year. A premium of about \$5 a ton is asked for delivery in 60 or 90 days and small lots for prompt shipment bring 2.25c. The official price, which is only for late delivery, remains at 1.60c.

Sheets.—While there have been no heavy transaction the sheet market shows some signs of improvement. The price of 3c. is firmly held for No. 28 gauge. Galvanized sheets are weaker. On large lots 75 and 5 per cent off the list is quoted while car load lots are held at 75 per cent off.

Ferro-manganese.—There is no change in the market. No sales of domestic 80 per cent have been made and the foreign product ranges in price from \$51.50 to \$53.

New York Sept. 4.

Pig Iron.—The market has been more quiet, but prices are very firm. There is little iron for sale. Some re-sales to foundry men are reported, on private terms. We quote for 1903 delivery, Northern iron at tidewater: No. 1X, foundry, \$23@25; No. 2X, \$22 @23; No. 2 plain, \$21@22. For Southern iron on dock, New York, No. 1 foundry, \$22@23; No. 2 \$21.75@22.25; No. 3, \$21@21.50. Middlesboro pig has sold at \$18.50, and is quoted at \$19.

Cast Iron Pipe.—The market shows no especial change, 8-in. pipe being quoted at \$34.25, gross ton, at tidewater.

Bar Iron and Steel.—We quote large lots on dock: Refined bars, 1.95@2.05c.; common, 1.85@1.90c.; soft steel bars, 2@2.10c.

Plates.—The market continues very strong. We quote for tidewater delivery in car-loads: Tank, 1/4-in. and heavier, 2.05@2.30c.; flange, 2.15@2.40c.; marine, 2.25@2.50c.; universal, 2.05@2.25c.

Steel Rails.—The local market is quiet, with quota-

tions unchanged. Standard sections are quoted at \$28, f. o. b. mills for 1903 delivery; light rails, \$30 @ \$35, according to weight.

Structural Material.—Demand is still strong. Premiums are being paid for small lots, and deliveries are hard to get. We quote for forward delivery at sidewater as follows: Beams and channels, 2@2.30c.; tees, 2@2.25c.; angles, 2@2.25c.

CHEMICALS AND MINERALS.

(See also wholesale prices-current on page 334.)

New York. Sept. 4.

Heavy Chemicals.—There is a growing demand for alkali and caustic soda for this and next year's delivery, as the big glass works are coming into the market again. Sal Soda also shows an improved inquiry at stiff prices. Bleaching powder is still weak, pending the issue of the 1903 price list for prime brands. It is understood some outside makes have sold over next year at about \$1.50 per 100 lbs.

Domestic chemicals, we quote, per 100 lbs., f. o. b. works, as follows: High-test alkali, in bags, 82½¢ @ \$7½¢, for prompt shipment, and 77½¢ @ \$0c. for forward; caustic soda, high-test, \$1.90 @ \$1.95 for early delivery, and \$1.85 @ \$1.87½ for futures; bicarb. soda, ordinary, 95¢ @ \$1, and extra, \$3; sal soda, 65¢: chlorate of potash crystals, \$7.75; bleaching powder, off-test, \$1.35—best grades mostly under contract. For foreign goods we quote per 100 lbs. in New York: Alkali, high-test, 90¢ @ 92½¢; caustic soda, high-test, \$2.25; sal soda, 67½¢ @ 70¢; bleaching powder, prime brands, Liverpool, \$1.75; Continental, \$1.60 @ \$1.65.

Imports of heavy chemicals into the United States in the 7 months ended July 31 were as follows: Alkali, 15,610,477 lbs. (15,697,250 lbs. in 1901); caustic soda, 2,136,579 lbs. (2,029,413 lbs.); sal soda, 2,249,684 lbs. (2,731,858 lbs.); bleaching powder, 71,951,334 lbs. (62,469,870 lbs.); chlorate of potash, 774,075 lbs. (497,424 lbs.). Re-exports were: Alkali, 24,978 lbs. (224,062 lbs. in 1901); caustic soda, 846,502 lbs. (586,623 lbs.); sal soda, nil (2,170 lbs.); bleaching powder, 168,768 lbs. (1,376 lbs.); chlorate of potash, 148,480 lbs. (102,400 lbs. in 1901). There has been a large increase in the consumption of foreign bleaching powder.

Acids.—Contract deliveries are pretty good. Further shading in sulphuric acid prices is reported among jobbers.

Quotations per 100 lbs. are as below, unless otherwise specified, for large lots in carboys or bulk (in tank cars) delivered in New York and vicinity.

Blue vitriol	4.60 @ \$5.00	Oxalic, com'l.	4.60 @ \$5.00
Muriatic, 18 deg.	1.50	Sulphuric, 50 deg.	
Muriatic, 20 deg.	1.62½	bulk, ton	13.50 @ 15.50
Muriatic, 22 deg.	1.75	Sulphuric, 60 deg.	1.05
Nitric, 36 deg.	4.00	Sulphuric, 66 deg.	
Nitric, 38 deg.	4.25	bulk	18.00 @ 20.00
Nitric, 40 deg.	4.50	Sulphuric, 68 deg.	1.20
Nitric, 42 deg.	4.87½	Sulphuric, 66 deg.	
		bulk	21.00 @ 23.00

The exports of copper sulphate from the United States in the 7 months ending July 31 amounted to 29,356,372 lbs., as against 46,524,035 lbs., showing a decrease of 17,167,663 lbs., due chiefly to the smaller demand in Italy and Austria.

Brimstone.—As spot stocks are nil, cargoes on steamers due command strong prices. Sales of best unmixed seconds ex-steamer have been made at \$23.50 per ton, while shipments are quoted at \$22.25 @ \$22.50. Best thirds are offered at \$1.50 less than seconds.

The imports of brimstone into the United States in the 7 months ending July 31 amounted to 95,912 tons, which compares with 91,183 tons in the corresponding period last year, showing an increase of 4,729 tons, credited to the consumption of paper mills.

The exports of brimstone from Sicily in July amounted to 23,905 tons, and in the 7 months this year to 280,164 tons. In the corresponding 7 months last year the exports totaled 308,640 tons, showing a falling off in 1902 of 28,476 tons. Stocks on hand in Sicily on July 31, 1902, were 282,455 tons, which compares with 196,428 tons last year, showing an accumulation of 86,027 tons, or nearly 44 per cent. The decrease in exports and an increase in stocks are due to a curtailed consumption in important European countries, especially France, due partly to high prices.

Pyrites.—There has been an arrival at New York this week of 3,993 tons iron pyrites from Huelva, Spain. The ocean freight rate to-day is 10s. 3d. (\$2.46), which is somewhat higher than was chartered a few weeks ago. During the 7 months ending July 31 the United States imported 250,563 tons of pyrites, chiefly from Spain, which shows an increase over last year of 22,848 tons, or over 10 per cent.

Quotations are f. o. b. Mineral City, Va.: Lump ore, \$5 per ton, and fines 10c. per unit; Charlemont, Mass., lump, \$5, and fines, \$4.75. Spanish pyrites, 13 @ 13½¢ per unit, New York and other Atlantic ports. Spanish pyrites contain 46 to 51 per cent of sulphur; American, from 42 to 44 per cent.

Sulphate of Ammonia.—Holders of 24 @ 25 per cent gas liquor quote immediate deliveries at \$2.90 @ \$2.95 per 100 lbs., and futures, \$2.97½ @ \$3.

Nitrate of Soda.—The market continues to

strengthen spot, and this year's shipments are quoted on the basis of \$1.90 per 100 lbs., while distant futures are worth \$1.85 @ \$1.87½. The British bark *Itata* has been chartered from the west coast of South America to New York or Philadelphia at 17s. 6d. (\$4.20), prompt sailing.

Phosphates.—Heavy shipments from mines are looked for this month. In the 7 months ending July 31 the exports from the United States totaled 456,416 tons, which compares with 399,308 tons last year, showing an increase of 57,108 tons, credited to Florida high-grade rock.

Phosphates.	Per ton F. o. b.	United Kingdom or European Ports.	
		Unit.	Long ton.
* Fla. hard rock (78 @ 80%)	\$.65 @ 7.00	6½ @ 6¼d.	\$.68 @ 9.88
* Fla. land pb. (68 @ 73%)	3.00 @ 3.25	4½ @ 5d.	6.65 @ 7.00
† Tenn., (78 @ 82%) export.	3.25 @ 3.50	5½ @ 6d.	\$.58 @ 9.36
† Tenn., 78% domestic	3.00		
† Tenn., 75% domestic	2.75 @ 3.00		
† Tenn., 73 @ 74% domestic	2.40		
† Tenn., 70 @ 72% domestic	2.10 @ 2.25		
† So. Car. land rock	3.25	4½ @ 5d.	5.67 @ 6.30
† So. Car. river rock	2.75 @ 3.00		
Algerian (63 @ 68%)		5½ @ 6¼d.	7.15 @ 8.13
Algerian (58 @ 63%)		5 @ 5½d.	6.00 @ 6.90
Algerian (53 @ 58%)		4½ @ 5d.	5.32 @ 5.58

* Fernandina, Brunswick or Savannah.
† Mt. Pleasant. ‡ On vessels, Ashley River.

Liverpool. August 26.

(Special Report of Joseph P. Brunner & Co.)

The spot market for chemicals is steady, and a moderate trade is passing. Soda ash, nearest spot range for tierces is as follows: Leblanc ash, 48 per cent, £5 15s. @ £6; 58 per cent, £6 2s. 6d @ £6 7s. 6d. per ton, net cash. Ammonia ash, 48 per cent, £4 5s. @ £4 10s.; 58 per cent, £4 11s. @ £4 15s. per ton, net cash. Bags, 5s. per ton under price for tierces. Soda crystals are moving off at generally £3 7s. 6d. per ton, less 5 per cent for barrels, or 7s. less for bags, with special terms for certain export quarters. Caustic soda, we quote: 60 per cent, £8 15s.; 70 per cent, £9 15s.; 74 per cent, £10 5s.; 76 per cent, £10 10s. per ton, net cash. Bleaching powder is dull and lifeless at nominally £6 12s. 6d @ £6 15s. per ton, net cash, for hardwood packages, with special quotations for the Continent and a few other export markets. For 1903 delivery manufacturers are declining to give firm offers, but are soliciting bids. Chlorate of potash is firm at 3d. per lb., net cash. Bicarb. soda is firm at £6 15s. per ton, less 2½ per cent for the finest quality in 1-cwt. kegs, with usual allowances for larger packages, also special quotations for a few favored markets. Sulphate of ammonia is wanted for immediate delivery to fill August contracts, and £12 7s. 6d. @ £12 10s. per ton, less 2½ per cent, is nearest value for good gray 24 @ 25 per cent, in double bags, f. o. b. here, while about 10s. less would be accepted for September delivery. Nitrate of soda is quoted on spot at £8 15s. @ £9 per ton, less 2½ per cent for double bags, f. o. b. here, and a limited business passing at the range.

METAL MARKET.

New York. Sept. 4.

GOLD AND SILVER.

Gold and Silver Exports and Imports.

At all United States Ports in July and Year.

Metal	July.		Year.	
	1901.	1902.	1901.	1902.
Gold:				
Exports....	\$2,875,120	\$7,670,808	\$32,399,346	\$27,947,040
Imports....	4,076,113	1,694,421	20,004,983	14,781,765
Excess, I.	\$1,200,993	E. \$6,076,387	E. \$12,394,363	E. \$13,165,28
Silver:				
Exports....	\$3,938,747	\$3,671,814	\$32,272,749	\$26,196,848
Imports....	2,562,973	2,456,547	17,987,339	14,677,286
Excess, E.	\$1,276,674	E. \$1,215,267	E. \$14,575,410	E. \$11,522,563

These figures include the exports and imports at all United States ports, and are furnished by the Bureau of Statistics of the Treasury Department.

Gold and Silver Exports and Imports, New York.

For the week ending Sept. 4 and for years from January 1.

Period.	Gold.		Silver.		Total Excess Exports or Imports.
	Exports.	Imports.	Exports.	Imports.	
Week...					
1902...	\$9,750	\$174,074	\$2,967	E.	\$81,357
1901...	\$4,513,808	1,658,762	16,951,505	\$25,654	E. \$8,980,857
1900...	25,801,839	2,119,466	21,948,074	2,625,006	E. 42,965,441
1900...	36,388,255	1,733,228	26,762,934	3,446,634	E. 57,971,327

Financial Notes of the Week.

Business generally continues steady, and rumors of a settlement of the coal strike have had rather a favorable effect. In view of the higher rates for money

in New York there is some talk of gold imports, but none have been made.

The statement of the New York banks, including the 63 banks represented in the Clearing House, for the week ending August 30, gives the following totals, comparison being made with the corresponding weeks of 1901 and 1900:

Loans and discounts	\$.816,849,000	\$895,186,600	\$910,040,000
Deposits	903,486,900	968,121,900	935,908,500
Circulation	28,902,300	30,097,400	32,935,100
Specie	176,904,400	176,791,400	167,427,000
Legal tenders	76,045,800	77,159,000	77,315,400
Total reserve	\$252,950,200	\$253,950,400	\$243,742,400
Legal requirements	200,871,725	242,030,475	233,977,125
Balance surplus	\$52,078,475	\$11,919,925	\$9,765,275

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars and comparison made with the holdings at the corresponding date last year:

N. Y. Ass'n	\$.176,791,400	\$167,427,000	
England	197,051,235	189,640,690	
France	487,791,930	\$224,318,100	\$224,505,080
Germany	163,275,000	67,455,000	69,190,000
Spain	70,020,000	85,645,000	71,155,000
Neth'lds	31,257,000	27,973,500	23,709,000
Belgium	15,473,500	7,738,500	15,853,335
Italy	79,300,000	9,887,000	80,525,000
Russia	349,245,000	36,855,000	372,805,000

The return of the Associated Banks of New York are of date August 30 and the others August 28, as reported by the *Commercial and Financial Chronicle* cable. The New York banks do not report silver separately, but specie carried is chiefly gold. The Bank of England reports gold only.

The silver market continues extremely dull, with a sagging tendency.

The United States Assay Office in New York reports receipts of 62,000 oz. silver for the week.

Shipments of silver from London to the East for the year up to August 21 are reported by Messrs. Pixley & Abell's circular as follows:

	1901.	1902.	Changes.
India	£5,025,410	£4,077,835	D. £947,575
China	398,685	135,850	D. 262,835
The Straits	79,976	94,550	I. 14,574
Totals	£5,504,071	£4,308,235	D. £1,195,836

Receipts for the week were £147,850 in bar silver from the United States, and £10,200 from Australia; total, £158,050. Shipments were £69,250 to Bombay, £60,000 to Calcutta, £1,150 to Colombo, and £5,000 to Malta; total, £135,400 in bar silver.

Indian exchange has been somewhat firmer, in view of better crop reports and increasing trade. The Council bills offered in London were taken at an average of 15.96d. per rupee. There has been considerable trading in rupee paper at an advance, on account of reports that the Indian Government will guarantee payment of interest at the fixed rate of 16d. per rupee.

Gold exports from Australia up to July 31 are reported as follows:

	1901.	1902.	Changes.
Melbourne	£2,531,875	£2,278,354	D. £253,521
Sydney	1,363,899	813,350	D. 550,549
Fremantle	2,405,185	2,912,555	I. 507,370

Total £6,300,959 £8,004,259 D. £2,527,200

The exports this year included £1,436,521 to India, £170,231 to China and £1,900,000 to South Africa; the balance going to Great Britain.

The foreign merchandise trade of France for the seven months ending July 31 is valued by the Ministry of Commerce as below:

	1901.	1902.
Imports	Fr. 2,610,515,000	Fr. 2,606,507,000
Exports	2,308,113,000	2,413,514,000
Excess, imports	302,402,000	192,993,000

This shows a decrease of 4,008,000 fr. in imports, chiefly in food; an increase of 105,401,000 fr. in exports, chiefly in manufactures; and a decrease of 109,409,000 fr. in the balance of imports.

The coinage executed at the mints of the United States in August is reported by the Bureau of the Mint, Treasury Department as below:

Denomination—	Pieces.	Value.
Double eagles	355,000	\$7,100,000
Eagles	48,000	480,000
Half eagles	92,000	460,000
Quarter eagles	.....	.....
Total gold	495,000	\$8,040,000
Dollars	1,778,000	1,778,000
Half dollars	100,000	50,000
Quarter dollars	812,000	203,000
Dimes	2,050,000	205,000
Total silver	4,740,000	\$2,236,000
Five nickels	2,236,000	111,800
One bronze	9,931,000	99,310
Total minor	12,107,000	\$211,110
Total coinage	17,402,000	\$10,487,110

In addition to the above there were coined for the Governments of Venezuela and Colombia, the following coins:

	Pieces.	U. S. subsidiary value.
For Venezuela—		
Five bolivars.....	225,000	\$225,000.00
Two bolivars.....	187,500	69,583.34
For Colombia—		
Fifty centavos.....	500,000	231,944.45

The coinage for these two South American countries is the first reported this year.

The Treasury Department's estimate of the money in the United States on September 1 is as follows:

	Total.	In Treasury.	In Circulation.
Gold coin (inc. bullion in Treasury).....	\$1,203,511,751	\$204,657,694	\$632,209,118
Gold certificates.....			306,644,939
Silver dollars.....	542,363,298	10,021,000	70,984,878
Silver certificates.....			452,357,023
Subsidiary silver.....	97,766,461	10,351,174	87,415,287
Treas. notes of 1890.....	27,701,000	78,250	27,622,750
U. S. notes.....	346,681,016	5,539,242	341,141,774
Currency certifi.....			4.75
Nat. Bank notes.....	361,282,691	14,725,312	346,557,379
Total.....	\$2,579,306,217	\$314,373,272	\$2,264,932,945

Population of the United States, September 1, 1902, estimated at 79,344,000; circulation per capita, \$28.55.

For redemption of outstanding certificates an exact equivalent in amount of the appropriate kinds of money is held in the Treasury, and is not included in the account of money held as assets of the Government.

This statement of money held in the Treasury as assets of the Government does not include deposits of public money in National Bank Depositories, amounting to \$118,065,498.

The amount in circulation was \$4,326,808 greater than on August 1, and \$67,143,121 greater than on September 1, 1901.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars.....	\$0.40 3/4	\$0.42
Peruvian soles and Chilean pesos.....	39 1/4	42
Victoria sovereigns.....	4.86	4.88
Twenty francs.....	3.86	3.88
Twenty marks.....	4.75	4.80
Spanish 25 pesetas.....	4.78	4.82

OTHER METALS.

Daily Prices of Metals in New York.

Aug. Sept.	Silver			Copper			Spelter			
	Sterling Exchange	N. Y. Cts.	London Pence.	Per lb.	Electrolytic per ton.	London per ton.	Lead per lb.	N. Y. cts.	St. L. cts.	
23	4.80 1/2	52 3/4	24 1/2	11 1/4	11 1/4	51 1/2	2 3/4	4.05	5.50	5.25
29	4.80	52 1/2	24 1/4	11 1/4	11 1/4	51 1/2	2 3/4	4.05	5.50	5.25
30	4.80 1/2	52 3/4	24 1/2	11 1/4	11 1/4	51 1/2	2 3/4	4.05	5.50	5.25
1			24 1/2			51 1/2				
2	4.80 1/2	52 3/4	24 1/2	11 1/4	11 1/4	51 1/2	2 3/4	4.05	5.50	5.25
3	4.80 1/2	52	24	11 1/4	11 1/4	51 1/2	2 3/4	4.05	5.50	5.25
4	4.80 1/2	52 1/4	24 1/4	11 1/4	11 1/4	51 1/2	2 3/4	4.05	5.50	5.25

London quotations are per long ton, (2,240 lbs.) standard copper, which is now the equivalent of the former g. m. b's. The New York quotations for electrolytic copper are for cakes, ingots or wirebars; the price of electrolytic cathodes is usually 0.25c lower than these figures.

Copper.—The market has been more active than for some time past, and purchases have been on a more liberal scale, both for home trade and for export. The demand has been freely met, but it appears that several of the larger producers are now well sold up for the balance of the year. We quote Lake copper at 11 1/2@11 3/4c.; electrolytic, in cakes, wirebars and ingots, at 11 1/4c.; in cathodes, at 11c.; casting copper, at 11 1/4c.

The London market, which closed last Thursday at £51 8s. 9d. for spot, £51 15s. for three months, held at about these figures until Monday, when it started to improve, moving to £51 15s. on that day, and to £51 17s. 6d. on Tuesday, at which figure spot closed on Thursday, three months selling at £52.

Refined and manufactured sorts we quote: English tough, £55@£55 10s.; best selected, £55@£55 15s.; strong sheets, £68; India sheets, £66 10s.; yellow metal, 6d.

Statistics for the second half of August show a decrease in the visible supplies of 30 tons.

Imports of copper and copper material into the United States, with re-exports of foreign metal, for the seven months ending July 31, are reported by the Bu-

reau of Statistics of the Treasury Department as below, in long tons of 2,240 lbs.

	1901.	1902.	Changes.
Ore and Matte:			
Imports.....	44,943	42,217	D. 2,726
Re-exports.....	6,693	12,142	I. 5,449
Net imports.....	38,250	30,075	D. 8,175
Copper, metallic:			
Imports.....	17,415	19,226	I. 1,811
Re-exports.....	4,321	3,118	D. 1,202
Net imports.....	13,094	16,108	I. 3,014

As the reports do not separate ore and matte, it is difficult to ascertain the copper contents of these imports. An approximate estimate puts the total net imports, reduced to fine copper, at 31,150 tons this year, against 32,200 tons in 1901. Of the total ore and matte imported this year, 21,466 tons were from Canada and 17,636 tons from Mexico; of the fine copper, 10,971 tons were from Mexico and 7,626 tons from Great Britain.

Exports of domestic material for the seven months are given by the Bureau as follows, also in long tons:

	1901.	1902.	Changes.
Copper, metallic.....	45,749	102,356	I. 56,607
Ore and matte.....	7,751	11,083	I. 4,332

Mr. John Stanton's statement, heretofore published, estimates the total exports for the seven months, in fine copper, at 109,669 tons, against 54,851 tons last year.

Exports of copper from New York and Philadelphia in the week ending September 4 were: Great Britain, 45; Germany, 315; Holland, 866; France, 250; Italy, 110; Austria, 220; Denmark, 20; Russia, 100; Sweden, 15; total, 1,941 tons. Imports were 583 tons copper from Mexico.

Tin.—The market has been very dull, buyers holding aloof in consequence of the decline in London. Spot tin sold down to 27 3/4c., September delivery to 26 7/8c.

The London market, which closed last Thursday at £124 5s. for spot, £120 for three months, went down to £123 10s. for spot, £119 2s. 6d. for three months on Friday. On Monday it was about the same, as also on Tuesday, but on Wednesday spot declined to £123, and three months went down to £117 2s. 6d. On Thursday, the market improved slightly for three months, which then sold at £118 15s., spot still selling at £123.

Statistics for the month of August show a decrease in the visible supplies of 1,100 tons.

Imports of tin into the United States for the seven months ending July 31 are reported as follows, in long tons of 2,240 lbs.:

	1901.	1902.	Changes.
Straits.....	11,726	12,786	I. 1,060
Australia.....	282	135	D. 147
Great Britain.....	7,020	8,665	I. 1,645
Holland.....	687	801	I. 114
Other countries.....	106	345	I. 239
Totals.....	19,821	22,732	I. 2,911

Approximately 90 per cent of the supply this year came from the Malay Peninsula, as most of the metal imported through Great Britain is Straits tin. That imported through Holland is chiefly Banca tin.

Visible stocks of tin on September 1 are reported as below, in long tons of 2,240 lbs.:

	Store.	Afloat.	Totals.
U. S. exc. Pacific ports.....	2,819	3,970	6,789
London.....	3,657	4,053	7,710
Holland.....	1,340	445	1,785
Totals.....	7,816	8,477	16,293

This shows a decrease of 516 tons, as compared with September 1, 1901.

Lead.—The market is active, and a large business is doing. We quote St. Louis at 4.00@4.05c.; New York, at 4.05@4.10c.

From abroad the quotation for Spanish lead is cabled at £10 8s. 9d.@£11; English lead, 5s. higher.

Imports of lead into the United States, and re-exports of imported lead, for the seven months ending July 31, are reported by the Bureau of Statistics of the Treasury Department as below; the figures are in short tons of 2,000 lbs.:

	1901.	1902.	Changes.
Lead, metallic.....	124	2,159	I. 2,035
Lead in ores and base bullion.....	71,172	61,779	D. 9,393
Total imports.....	71,296	63,938	D. 7,358
Re-exports.....	63,073	49,952	D. 13,121
Balance.....	8,223	13,984	I. 5,761

Of the imports this year, 56,044 tons, or 87.3 per cent of the total, were from Mexico, and 5,587 tons, or 8.7 per cent, from Canada. In addition to the re-exports given above, there were 3,168 tons of domestic lead exported this year, against 2,322 tons in the corresponding period of 1901, an increase of 846 tons this year.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is strong at 4 to 4.02 1/2c. for Missouri brands, and 4.05 for argentiferous lead.

Spanish Lead Market.—Messrs. Barrington & Holt report from Cartagena, Spain, under date of August 16, as follows: The price of silver during the week has been 13.25 reales per ounce. The exchange has gone up by 1 centimo, making it 34.41 pesetas to £1. The local quotation for pig lead on wharf has been 61.25 reales per quintal, which, on above exchanges, is

equal to £9 19s. 5d. per ton of 2,240 lbs., f. o. b. Cartagena. Exports of pig lead have been 1,015,020 kgs. to London; 317,075 kgs. to Marseilles; total, 1,332,095 kgs. Exports also included 998 kgs. silver bars to Marseilles.

Spelter.—The market is very firm. Most of the smelters appear to be sold out for early delivery, and there is considerable business still to be placed, so that a scarcity for September is expected. We quote 5 1/4c. St. Louis, 5 1/2c. New York.

The foreign market has advanced, good ordinaries being quoted at £19 7s. 6d.; specials, 5s. higher.

Exports of spelter, or metallic zinc, from the United States for the seven months ending July 31 were 2,880 short tons, against 2,327 tons in the corresponding period in 1901, an increase of 553 tons. Exports of zinc ore were 25,752 tons, against 22,315 tons last year, an increase of 3,437 tons.

Exports of zinc oxide, or zinc white, for the seven months were 6,679,589 lbs., against 5,304,434 lbs. in 1901, an increase of 1,375,155 lbs. this year.

St. Louis Spelter Market.—The John Wahl Commission Company telegraphs us as follows: Spelter is firm, and is selling at 5.20@5.25c. for prompt deliveries, and 5.15c. for futures.

Spanish Zinc Ore Market.—Messrs. Barrington & Holt report from Cartagena, Spain, under date of August 16, that the only shipments for the week were 3,500 tons blende to Antwerp.

Antimony.—We quote Cookson's at 9 3/4c.; Hallett's, 8c.; Japanese, Italian, Hungarian and United States Star, at 7 3/4c.

Imports of antimony into the United States for the seven months ending July 31 were as follows, in pounds:

	1901.	1902.	Changes.
Metal and regulus.....	2,199,683	3,187,533	I. 987,850
Antimony ore.....	1,571,751	260,127	D. 1,311,624

The increase in metal was equal to 44.9 per cent; the decrease in ore, to 83.4 per cent.

Nickel.—The price is now quoted by leading producers at 40@47c. per lb. for large quantities down to ton lots, according to size and terms of order. The price for smaller lots, according to quantity, runs as high as 60c. per lb.

Exports of nickel, nickel oxide and nickel matte from the United States for the seven months ending July 31 were 1,663,427 lbs., against 3,409,928 lbs. for the corresponding period in 1901, a decrease of 1,746,501 lbs., or 51.2 per cent, this year. Most of these exports were metal and oxide made here from Canadian ores and matte.

Platinum.—Consumption continues good, and prices are firmer. Ingot platinum in large lots brings \$19 per oz. in New York.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 73 1/2c. per gram.

Imports of platinum into the United States for the seven months ending July 31 were 4,555 lbs., against 3,895 lbs. for the corresponding period in 1901, an increase of 660 lbs., or 16.9 per cent, this year.

Quicksilver.—The New York price continues \$48 per flask for large orders, with a slightly higher figure for small lots. In San Francisco prices are steady, and the quotations are \$45.50@46.50 per flask for domestic orders. For export orders \$44 per flask is quoted. The London price remains £8 15s. per flask, with the same figure quoted from second hands.

Exports of quicksilver from all United States ports for seven months ending July 31 were 403,257 lbs. (5,271 flasks), against 474,212 lbs. (6,199 flasks) in the corresponding period in 1901, a decrease of 70,955 lbs. (927 flasks), or 15 per cent, this year.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as follows:

	Per lb.	Per lb.
Aluminum.....	33@37c.	38@40c.
No. 1, 99% ingots.....	31@34c.	31@34c.
No. 2, 90% ingots.....	4c. up	4c. up
Alum-bronze.....	20@23c.	20@23c.
Nickel-alum.....	33@39c.	33@39c.
Bismuth.....	\$1.50	\$1.50
Chromium, pure (N.Y.).....	80c.	80c.
Copper, red oxide.....	50c.	50c.
Ferro-Molyb'dum (50%).....	\$1.25	\$1.25
Ferro-Titanium (10%).....	90c.	90c.
Ferro-Titanium (20@25%, N. Y.).....	55c.	55c.
Ferro-Tungsten (37%).....	28c.	28c.
Magnesium.....	\$2.75	\$2.75
Manganese, pure (N.Y.).....	80c.	80c.
Mangan' Cop. (20% Mn).....	32c.	32c.
Mangan' Cop. (30% Mn).....	38c.	38c.
Molyb'dum (Best).....	\$1.52	\$1.52
Phosphorus.....	50c.	50c.
American.....	70c.	70c.
Sodium metal.....	50c.	50c.
Tungsten (Best).....	62c.	62c.

Variations in price depend chiefly on the size of the order.

Average Prices of Metals per lb., New York.

Month.	1902.	1901.	100	1901.	Spelter.	1901.
January.....	23.54	28.51	4.900	4.350	4.27	4.18
February.....	24.07	28.68	4.075	4.350	4.15	4.01
March.....	24.32	28.03	4.075	4.350	4.28	3.91
April.....	27.77	25.93	4.075	4.350	4.37	3.99
May.....	29.55	27.12	4.075	4.380	4.47	4.04
June.....	29.38	28.90	4.075	4.350	4.96	3.99
July.....	28.39	27.55	4.075	4.350	5.37	3.95
August.....	28.23	28.75	4.075	4.350	5.44	3.90
September.....	25.31	28.51	4.350	4.350	5.44	4.08
October.....	26.62	28.51	4.350	4.350	5.44	4.23
November.....	26.67	28.51	4.350	4.350	5.44	4.23
December.....	24.36	28.51	4.153	4.350	5.44	4.21
Year.....	28.54	28.54	4.354	4.354	5.44	4.06

Average Prices of Copper.

Table with columns: Month, Electrolytic (1902, 1901), Lake (1901), London Standard (1902, 1901). Rows include January through December and Yearly averages.

New York prices are in cents, per pound; London prices in pounds sterling, per long ton of 2,240 lbs., standard copper. The prices for electrolytic copper are for cakes, ingots or wire bars; prices of cathodes are usually 0.25 cent lower.

Average Prices of Silver, per ounce Troy.

Table with columns: Month, London (1902, 1901), N. Y. (1902, 1901). Rows include January through December and Yearly averages.

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

DIVIDENDS.

Table with columns: Name of Company, Latest Dividend (Date, Share, Total), Total to Date. Lists various mining and industrial companies with their respective dividend details.

ASSESSMENTS.

Table with columns: Name of Company, Location No., Delinq., Sale, Amt. Lists companies and their assessment details.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies and their prices for August 28, 29, 30, and September 1, 2, 3.

BOSTON, MASS.*

Table of stock quotations for Boston, Mass., listing companies and their prices for August 28, 29, 30, and September 1, 2, 3.

Coal, Iron and Industrial Stocks.

Table of stock quotations for Coal, Iron and Industrial Stocks, listing companies and their prices for August 28, 29, 30, and September 1, 2, 3.

PHILADELPHIA, PA. §

Table of stock quotations for Philadelphia, Pa., listing companies and their prices for August 28, 29, 30, and September 1, 2, 3.

Total sales, 393,004 shares.

* Holiday.

† Ex-Dividend.

* Holiday.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.*

Table of stock quotations for Colorado Springs, Colo. listing companies like Acacia, Alamo, Am. Con., Anaconda, Ben Hur, Black Bell, Blue Bell, C. K. & N., Columbine-Victor, C. C. Con., Dante, Dr. Jack Pot, Elkon Con., El Paso, Fanny Rawlings, Findley, Gold Bond, Gold Dollar Con., Golden Cycle, Golden Fleece, Gold Boy, Hart, Iron Clad, Isabella, Jack Pot, Last Dollar, Lexington, Little Buck, Matoa, Mol. Gibson, Moon Anchor, Morning Star, National, Nellie, New Haven, Pappoose, Pharmacist, Pinnacle, Pointer, Portland, Prince Albert, Republic, Sunset Eclipse, Uncle Sam, Vindicator Con., and Work.

*Colo. Springs Mining Stock Exchange. All mines are in Colorado. Total sales 276,100 shares.

Colorado Springs (By Telegraph.)

Table of stock quotations for Colorado Springs (By Telegraph) listing companies like Acacia, Alamo, Anaconda, Cripple Creek, Doctor Jack Pot, El Paso, Elkon Con., Fanny Rawlings, Gold Dollar Con., Golden Fleece, Isabella, Jack Pot, Last Dollar, Mollie Gibson, Moon Anchor, Pharmacist, Portland, Prince Albert, Republic, Sunset Eclipse, Uncle Sam, Vindicator Con., and Work.

MEXICO.

Aug. 30.

Table of stock quotations for Mexico listing companies like Durango, Guanajuato, Angustias, Pozos, Cinco Senores y An., aviadoras, Cincos Senores y An., aviad., Providencia, San Juan de la Luz., Guerrero, Garduno y Anexas, Hidalgo, Amistad y Concordia, Carmen, aviad., Ca. Real del Monte., El Encino, aviad., Guadalupe Fresnillo y Anexas., La Blanca, aviad., La Blanca, aviad., Maravillas y An., aviad., Palma y An., aviad., Sta. Gertrudis y An., aviad., Sta. Gertrudis y An., aviad., Santo Tomas Apostol aviad., San Rafael y An., Trompillo, San Rafael y An., aviad., Soledad, aviad., Sorpresa, aviad., Mexico: Alacran, La Esperanza (El Oro), Michoacan: Luz de Borda, aviad., Luz de Borda, aviad., San Luis Potosi: Concepcion y An., El Barreno, aviad., Sta. Maria de la Paz., San Diego y Anexas., Zacatecas: Candelaria y Pinos., San Carlos y Anexas., Sta. Maria de Gaud., Miscellaneous: Bartolome de Medina, Guadalupe Hacienda, La Luz Hac. (Pachuca), La Reina (Chihuahua), Naica (Chihuahua), Natividad (Oaxaca) aviad., National (Oaxaca) aviad., San Francisco Hac., Santa Ana Huautla, Morelos, Union Hacienda.

ST. LOUIS, MO.*

Aug. 30.

Table of stock quotations for St. Louis, Mo. listing companies like Am.-Nettie, Colo., Catherine Lead, Mo., Central Coal & C., Central C. & C., pt., Columbia Lead, Mo., Con. Coal, Ill., Doe Run Lead Co., Granite Bimet, Mo., St. Joe Lead, Mo., American Boy, Cariboo, McK., Center Star, Granby, Con., Hecla, Morning Glory, Quilp, Rambler Cariboo, Republic, San Pol.

*From our Special Correspondent.

Total sales 45,000 shares. *Reported by Hunner & Harris.

LONDON.

Aug. 23.

Table of stock quotations for London listing companies like Anaconda, Copiapo, De Lamar, Enterprise, El Oro, Frontino & Bolivia, Hall Mfg. & Sm., Le Roi, Montana, Stratton's Independence, St. John del Rey, Utah Con., Ymir, Linars, Mason & Barry, Rio Tinto, Tharais, Australia and New Zealand, Assoc. Gold Mines, Broken Hill, Great B'd'r Pr'p., Hannan's Brownhill, Ivanhoe Gold Corp., Kalkurle, Lake View, Mt. Lyell, Mt. Morgan, Waihi, Champion Reef, Mysore Gold, Nundroog, Ooregum, Ooregum, British S. Africa, Cape Copper, Cape Colony, City and Sub'n, Crown Reef, De Beers, De Beers, Ferreira, Geldenhuis, Henry Nourse, Jagerfontein, Joh'n'g Con. Invest., Jubilee, Langlaagte, May Con., Meyer & Charlton, Namaqua, Primrose, Rand Mines, Robinson, Sheba, Wolhuter.

c.—Copper. d.—Diamonds. g.—Gold. l.—Lead. s.—Silver.

PARIS.

Aug. 13.

Table of stock quotations for Paris listing companies like Acieries de Creusot, Firminy, Huta-Bank, Anzin, Boleo, Briansk, Champ d'Or, Courrieres, Dombrowa, Dynamite Centrale, Escombre-Beyberg, Fraser River, Huanchaca, Laurium, Malfidano, Matoux, Cle. Fran. de, Mokta el Hadid, Napthe Nobel, Nickel, Penarroya, Rebecca, Salines du Midi, Vielle Montagne.

SALT LAKE CITY.*

Aug. 30.

Table of stock quotations for Salt Lake City listing companies like Ajax, Ben Butler, Bullion-Beck, California, Carisa, Century, Con. Mercur., Daly, Daly-Judge, Daly-West, Eagle & B, Grand Central, L. Mammoth, Mammoth, May Day, Ontario, Sacramento, Sac. Swansa., Swansa., Uncle Sam., Victor, Wabash, Yankee Con., Ontario, Olive, British Columbia, Cariboo McKibney, Center Star, Fairview, Lone Pine, Mt. Lion, North Star, Payne, Rambler-Cariboo, Republic, Virtue, White Bear, Winnipeg, Develop. Co., Can. G. F. S.

All mines are in Utah. *By our Special Correspondent. Total sales, 149,906 shares.

Total sales, 2,800 shares.

DIVIDENDS.

GOLD, SILVER, COPPER, LEAD, QUICKSILVER AND ZINC COMPANIES.

COAL, IRON AND INDUSTRIALS.

Table listing dividends for Gold, Silver, Copper, Lead, Quicksilver, and Zinc companies. Columns include Name and Location of Company, Authorized Capital Stock, Shares (Issued, Par Val), Dividends (Paid 1902, Total to Date, Latest Date, Amt.), and various company names like Adams, Aetna, Alaska Goldfields, etc.

Table listing dividends for Coal, Iron, and Industrial companies. Columns include Name and Location of Company, Authorized Capital Stock, Shares (Issued, Par Val), Dividends (Paid 1902, Total to Date, Latest Date, Amt.), and various company names like Ala. Con., Coal & Iron, Altona, American Agr. Chem., etc.

CANADA, CENTRAL AND SOUTH AMERICA. MEXICO.

Table listing dividends for companies in Canada, Central and South America, and Mexico. Columns include Name and Location of Company, Authorized Capital Stock, Shares (Issued, Par Val), Dividends (Paid 1902, Total to Date, Latest Date, Amt.), and various company names like Amistad y Concordia, Bartolome de Medina Mill, etc.

CHEMICALS, MINERALS, RARE EARTHS, ETC. CURRENT WHOLESALE PRICES. (See also Market Reviews.)

Table with multiple columns listing various chemical and mineral products such as Abrasives, Barium, Barytes, Borax, Bromine, Cadmium, Calcium, Cement, Ceresine, Charcoal, Chlorine, Chrome Green, Coal Tar Pitch, Cobalt, Copperas, Copper, Cryolite, Explosives, Feldspar, Flint Pebbles, Fluorspar, Fuller's Earth, Graphite, German, Gypsum, Infusorial Earth, Iodine, Iron, Lead, Lime, Magnesite, Manganese, Marble, Mercury, Mica, Mineral Wool, Nickel, Oils, Potash, Potassium, Quartz, Salt, Saltpetre, Silica, Silver, Sodium, Sulphur, Tar, Tin, Uranium, Zinc, and Zirconium. Each entry includes a description, measurement unit, and price.

THE RARE EARTHS.

Table listing rare earth elements and their compounds, including Boron, Calcium, Cerium, Didymium, Erbium, Glucinum, Lanthanum, Lithium, Strontium, Thorium, Uranium, and Zirconium. Columns include the element name, measurement unit, and price.

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable.